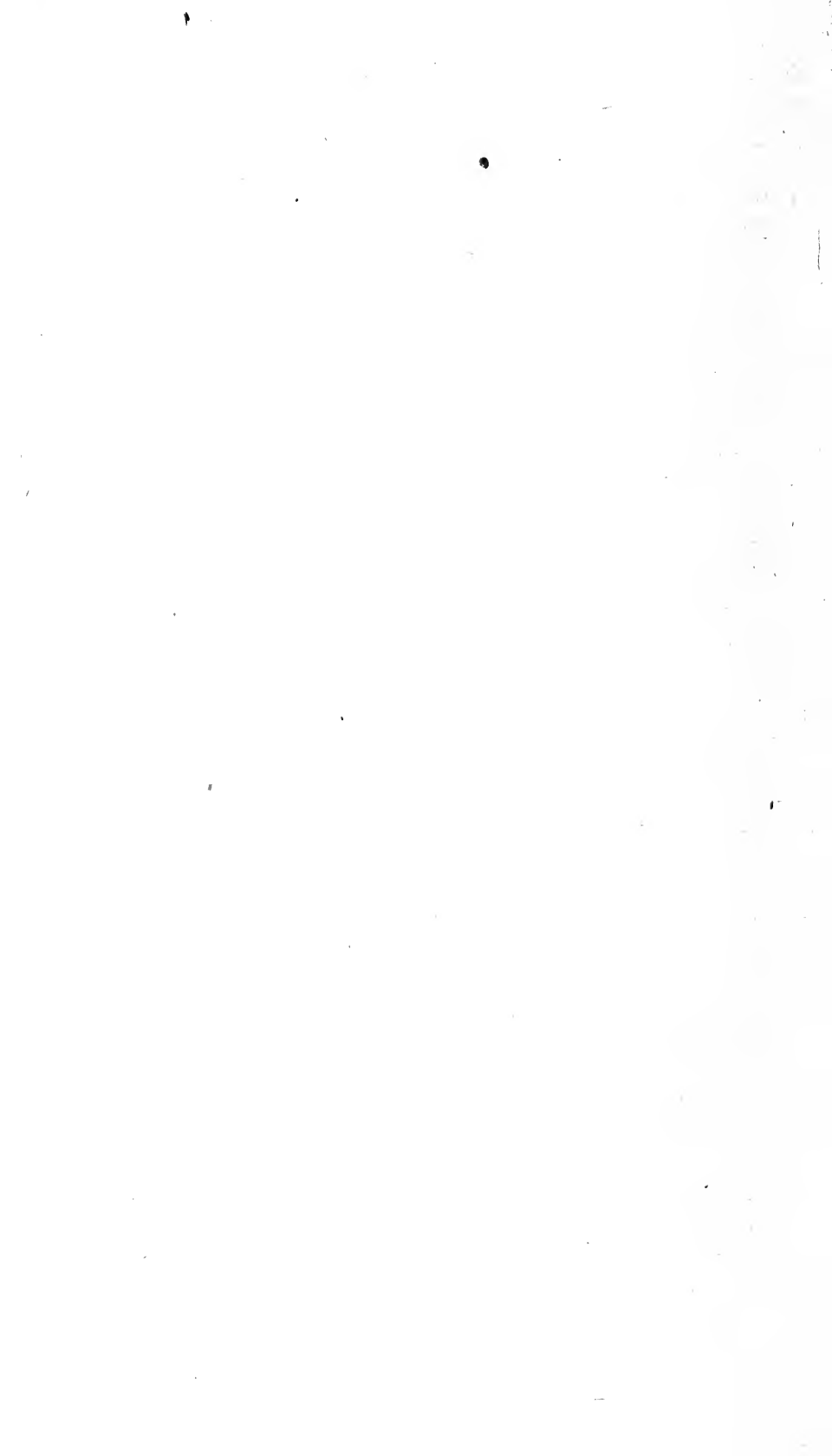




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OF CHAMBERS'S ENCYCLOPÆDIA,

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TO

CHAMBERS'S ENCYCLOPÆDIA.

DODINGTON, GEORGE BUDD, Baron Melcombe, 1691-1762; an English politician, graduate of Oxford, and in 1715 member of parliament. In 1716, he was envoy to Spain. In 1720, he inherited his uncle's vast estate, and built a mansion in Dorsetshire at a cost of \$700,000. He gathered around him the *litterati* of the time, among whom were Young, Thomson, and Fielding. In politics, he was variable. His diary, from 1749 until near his death, gives a vivid picture of the politics and manners of the time.

DODWELL, EDWARD, 1767-1832; an English antiquarian writer and draughtsman. From 1801 to 1806 he traveled in Greece, and spent the rest of his life for the most part in Naples and Rome. He wrote *A Classical and Topographical Tour through Greece*, and *Views and Descriptions of Cyclopean and Pelasgic Remains in Italy and Greece*, the last profusely illustrated. His widow, who was 30 years his junior, became the countess of Spaur, and was conspicuous, not only for beauty, but in the political life of Rome.

DODWELL, HENRY, 1641-1711; a native of Dublin, educated at a free school, and by the death of his parents reduced to great poverty. He became a fellow of Trinity college, and in 1688 was elected Camden professor of history at Oxford; but in 1691, he was deprived of his professorship for refusing to take the oath of allegiance to William and Mary. The remainder of his life was devoted to literary labors in chronology and ecclesiastical polity, and resulted in a number of valuable works. In religion, he was extreme, at one time promulgating the notion that immortality could be enjoyed only by those who had received baptism at the hands of one set of regularly ordained clergy, and was therefore a privilege from which dissenters were hopelessly excluded; again arguing from Scripture and the early fathers that the soul of man is naturally mortal, and gains continuance by only the special act of God. His son HENRY was the author of *Christianity not founded on Argument*, to which WILLIAM, another son, published a reply.

DOG DISTEMPER, a kind of violent catarrh, common among dogs, especially when young, producing running at the eyes and nose, and a dry cough, followed by wasting of flesh and loss of strength, and sometimes by inflammation of the lungs and dysentery. The usual remedies are laxatives, emetics, and occasional bleeding. Astringents are useful in diarrhea, and fits may be modified by anodynes and warm baths.

DOGSTAR. See **SIRIUS**, *ante*.

DOG WATCH, on shipboard there are two, usually from 4 to 6, and from 6 to 8 P. M.

DO'KOS, a race of blacks in Africa, s. of Abyssinia, almost dwarfs in size. They are in a wild state, and are the favorite prey of slave-stealers.

DOLABELLA, PUBLIUS CORNELIUS, b. about 70 B.C.; a Roman gen. of violent and wicked character, often involved in criminal acts, from which he was extricated by Cicero. When 30 years old he drove away his wife Fabia, and married Tullia, Cicero's daughter, against the father's consent. Being heavily in debt he fled from Rome to Cæsar's camp, and took part in the battle of Pharsalus. Returning to Rome, he gained immunity from his debts by securing for himself an election as tribune, and his first legislative act was to propose a law canceling all debts. He was so troublesome in Rome that, to remove him, Cæsar made him a gen. in Africa. Dolabella was ambitious to be consul, and Cæsar promised him the office; but Antony's opposition delayed the fulfillment, and before it could be arranged, Cæsar was murdered. Dolabella at

once seized the insignia of office, made friends with the assassins, and was confirmed in the office which he had usurped. He threw down an altar erected to Cæsar, and crucified those who would offer sacrifices upon it. Antony sent him in command of an expedition against the Parthians, where his cruelty and rapacity added infamy to a name already infamous. He tortured Trebonius at Smyrna for two days to force him to disclose the hiding-place of his treasures, and then murdered him. Hearing of this, the senate outlawed Dolabella, and sent Cassius to take his place. Having no further hope of power, Dolabella caused one of his own soldiers to kill him, 43 B.C.

DOLCE, LUDOVICO, or LUIGI, 1508-68; an Italian author, and a voluminous writer. He translated almost anything and everything from the Greek and Latin, and wrote original works, in all 70 in number. The best known is *Marianna*, a tragedy from the life of Herod, reproduced in French by Voltaire, and still on the stage. He also wrote the lives of Charles V. and Ferdinand I., many other dramas, and miscellaneous works.

DOLCINITES, or DULCINISTS, a sect established in Italy in the 13th c.; they were opposed to the popes, and their doctrines were similar in many respects to those of the spiritual Franciscans. In 1307, Dolcino, the founder of the sect, with some of his followers, was burned at the stake.

DOLET, ÉTIENNE, 1506-46; a French writer and printer, said to have been an illegitimate son of Francis I. In 1537, he obtained a privilege for ten years to print any works of his own or which had received his supervision. His liberality of sentiment was manifest from his press issues, which ranged from the New Testament in Latin to Rabelais in French. This liberality brought upon him the persecution of the Roman Catholic church, and after long watching he was arrested as a relapsed atheist, put to the torture, and burnt to death; the alleged cause being his insertion in Plato's *Axiarchus* of the words "Nothing at all," implying a denial of the immortality of the soul; and yet Plato's book more exactly and positively makes that denial. Dolet was an earnest advocate for the circulation of the Scriptures in the common language of the people.

DOLICOCEPHALIC, long-headed, a designation of human skulls which have the diameter from front to back much greater than the transverse diameter. Such are the heads of certain Australian and West African races. The opposite conformation is called *brachycephalic*, or short-headed.

DOLLIUM, a genus of gastropod mollusks having shells spirally furrowed, resembling the hoops on a cask. More than a dozen species are found in the warm seas of the east, and seven fossils are known.

DOLOMIEU, DÉODAT-GUI-SYLVAIN-TANCRÈDE GRATET DE, 1750-1801; a French geologist and mineralogist. He was one of the knights of Malta when a boy, and fought a duel with and killed a brother knight, for which he was condemned to death, but was saved in consequence of his youth. He then turned his attention to science, and visited Spain, Sicily, and the Pyrenees. He minutely described the earthquake in Calabria in 1783, and in later years studied the Alps, where he discovered the mineral "Dolomite," which is named after him. He became professor in the school of mines and a member of the institute from its formation. In 1798, he was on the scientific staff of Bonaparte's expedition to Egypt. Here he lost his health, and on the way home was left at Messina, where he was an object of political hatred because he had revealed to the grand master of Malta the designs of the Neapolitans against that island. He was confined in a wretched dungeon, clothed in rags, and given only a bed of straw. There he was kept 21 months. Denied writing materials, he made a pen from a piece of wood, and with the smoke of his lamp for ink, wrote on the margins of his Bible—the only book he possessed—his *Traité de Philosophie Minéralogique*, and *Memoire sur l'Espèce Minérale*. At the conclusion of the treaty between France and Naples, he was released, and took the chair of mineralogy in Paris, made vacant by the death of Daubenton.

DOMAIN. See DEMESNE, *ante*.

DOMAT, or DAUMAT, JEAN, 1625-96; a French writer, known chiefly from his elaborate digest entitled *Lois Civiles dans leur Ordre Naturel Suivies du Droit Public*, for which Louis XIV. settled upon him a pension of 2,000 livres. The work was published in English in 1722, and has passed through several editions.

DON, a title. See DOM, *ante*.

DOÑA AÑA, a co. in New Mexico, on the border of Texas and Mexico, intersected by the Rio Grande and the Rio Pecos, and by several mountain ridges; about 20,000 sq.m.; pop. '70, 5,864. The productions are wheat, corn, wool, and live stock. Co. seat, Doña Aña.

DONALDSON, JAMES LOWRY, b. Md., 1814; graduate of West Point; served in the Florida and the Mexican wars, and in the war of the rebellion, in all with distinction; rose to be maj.gen. in 1865, and in 1869, retired from active service. He wrote *Sergeant Atkins*, a tale of the Florida war.

DONA'TI, GIOVANNI BATTISTA, 1826-73; an Italian astronomer, professor in the royal institution at Florence. June 2, 1858, he discovered the comet now bearing his name. He discovered other comets, made spectroscopic observations, and published dia-

grams of lines in the spectra of the stars. In 1864, he was appointed director of the Florence observatory.

DONA'TI'S COMET, discovered June 2, 1858. It was nearest the earth Oct. 10, when its apparent length, 51,000,000 m., made it a sight of wonderful magnificence. Its distance in aphelion is estimated at 15 billions m., and its return to the solar system is not expected till the year 3808.

DON COSSACK, a government in Russia in Europe, n.e. of the sea of Aral, on the river Don; 61,911 sq.m.; pop. '70, 1,086,264. The country is generally level and sandy, and the climate mild, though in winter there are sometimes very cold and severe storms. Cattle-raising is the principal business; hemp and flax are raised, and wine, salt, and caviare are among the exports. Seat of government, Novo-Tcherkask.

DON'ELSON, Fort, on Cumberland river, Tenn., 12 m. e. of Fort Henry. It was an important point in the war of the rebellion, and was strongly held by the confederates until Feb., 1862, when the union forces under Grant laid siege to it. Buckner, the confederate commander, asked for terms, to which Grant replied: "No terms except unconditional surrender will be accepted. I propose to move immediately upon your works." Before night the fort and 8,000 prisoners were surrendered.

DONETZ, a river in s. Russia, a tributary of the Don. It is about 500 m. long, and is chiefly in the country of the Don Cossacks. It is navigable to Zmiev.

DONIPHAN, a co. in n.e. Kansas, on the Nebraska border and the Missouri river; crossed by the old California overland route, and by the Atchison and Nebraska, and the St. Joseph and Denver City railroads; 391 sq.m.; pop. '78, 15,122. The surface is chiefly prairie, and the soil good, producing wheat, corn, oats, butter, etc. Co. seat, Troy.

DON'NYBROOK, or **ST. MARY'S OF DONNYBROOK**, a village and parish in Dublin co., Ireland; now included in Pembroke, a western suburb of Dublin. The parish contains the villages of Donnybrook, Irishtown, Merrion, Ringsend, and Sandymount. The village of Donnybrook was long noted for its fair (begun under king John), kept up for half the month of August every year. In later times the fair lasted only a week. It was long notorious as a season of debauchery and fighting, and in 1855 was finally abolished.

DOBOV'KA, a t. on the Volga, in European Russia, government of Saratof; 180 m. w. of Saratof city; pop. '67, 13,676. The town has a number of manufactures, and an important river traffic.

DOOLY, a co. in s.w. Georgia, on Flint river; 530 sq.m.; pop. '70, 9,790—4,855 colored. The land is fertile, but much of it is occupied by pine forests. The chief productions are corn, cotton, and molasses. Co. seat, Vienna.

DOOR, a co. in n.e. Wisconsin, between Green bay and lake Michigan; 625 sq.m.; pop. '75, 8,020. Agriculture is the chief business. Co. seat, Gibraltar.

DOOR-KEEPER, in the senate and house of representatives of the federal congress, and in the corresponding bodies in state legislatures, an officer chosen by vote of the body who has general charge of the rooms. He announces messages from presidents, governors, or the co-ordinate legislative bodies; attends to the dispatch of documents, and assists the sergeant-at-arms in keeping order.

DOOSTEE, a river of Beloochistan, running s. through the entire country, and falling into the Arabian sea. It is about 900 m. long.

DORA D'ISTRIA. See **GHIKA HELENA**, *ante*.

DORCHESTER, a co. in s.e. Maryland, on Delaware and Chesapeake bays, intersected by the Delaware and Dorchester railroad; 640 sq.m.; pop. '70, 19,458—7,556 colored. Productions, wheat, corn, etc. Co. seat, Cambridge.

DORCHESTER, a co. in Canada, bordering on Maine, and drained in part by Chaudière river. Pop. '71, 17,779.

DORCHESTER (*ante*), formerly a t. in Norfolk co., Mass., but now the 16th ward of the city of Boston; pop. '75, 15,788. The locality was settled by Puritans from Dorchester, Eng., under the lead of the Rev. John White, who landed at Nantasket, June 11, 1630. The codfishery, so important to New England, originated in Dorchester, and there was erected the first mill in America driven by water-power. Large portions of this district are exceedingly attractive, with beautiful suburban residences.

DORDOGNE, a river rising in s. central France, running w. through the departments of Corrèze, Lot, and Dordogne, and falling into the Garonne, 13 m. n. of Bordeaux; about 220 m. long, and navigable for 150 miles.

DORNER, **ISAAK AUGUST**, D.D., b. Württemberg, 1809; son of a Lutheran minister; studied at Tübingen, and a professor there in 1838. Soon afterwards he was professor of divinity and counselor of the consistory at Königsberg. From 1847 to 1853, he held a chair at Bonn, then removed to Göttingen; and in 1862, was appointed professor of systematic theology and exegesis in the university of Berlin. His best known work is the *History of the Development of the Doctrine of the Personality of Christ*. This and others of his works have been published in English.

DOROGOI, or **DOROHOF**, a t. in Roumania in the n. part of Moldavia, 80 m. n.w. of Jassy, on the Shiska; pop. 10,000. It has a large transit trade, and several important annual fairs.

DORP, a t. in Prussia, in the government of Dusseldorf, 17 m. n.e. of Cologne; pop. 72, 10,690. It has recently grown to importance for manufactures of iron, steel, paper, tobacco, etc.

DORR, **THOMAS WILSON**, 1805-54; b. R. I.; graduate of Harvard, 1823. He was the leader of a party in 1840-41 whose object was to extend the right of suffrage in Rhode Island, it being much restricted by property qualifications, and otherwise. This party framed a new constitution, which was voted on, Dec., 1841, when it was claimed that a clear majority of the male citizens of the state voted for its adoption. In April, 1842, an election for state officers under this constitution was held, and Dorr was chosen governor. In May the new government undertook to organize and assume full power. They were resisted by the regular state government, and made some show of using force, but there was no actual fighting. Before the close of the month the Dorr-ites were scattered, and their leader was arrested, tried for treason, and sentenced to imprisonment for life, June 25, 1844. In 1847, he was released under an act of general amnesty, and in 1851, was restored to civil and political rights.

D'ORSAY, **ALFRED GUILLAUME GABRIEL**, Count, 1798-1852; a famous leader of society in London and Paris, who was not only the beau ideal of social elegance, but a man of universal intellectual and artistic gifts. Through his mother, by a morganatic marriage, he was a grandson of the king of Wurtemberg. When young he served in the French army, and in 1822, while stationed at Valence, on the Rhone, he made the acquaintance of the earl of Blessington and his family, an event which affected the course of his after life. In Dec., 1827, he married lady Harriet Gardner, 15 years of age, the daughter of the earl of Blessington by his first wife. The union was not happy, and was dissolved soon after Blessington's death in 1829. The widowed countess was accompanied to England by D'Orsay, and the two lived in the same house, their residence becoming a resort of the fashionable artistic and literary society of London. The count's charming manner, brilliant wit, and artistic faculty were accompanied by benevolent moral qualities which endeared him to all his associates. He was always a Bonapartist, and naturally hastened to Paris in 1849, all the more readily because his home in London had been broken up through bankruptcy. The countess went with him, but died a few weeks after their arrival. He then endeavored to support himself by painting portraits. Only a few before days his death he was appointed director of fine arts.

DORSEY, **JOHN SYNG**, 1783-1818; b. Philadelphia; studied medicine with Dr. Physick, and first became noted as a physician to a yellow-fever hospital. He was a highly accomplished surgeon, and author of *Elements of Surgery* and of various papers on medical subjects.

DORSIBRANCHIATES, worms living in mud or sand, or swimming in the sea, whose respiratory organs are in the form of tufts or branchial appendages along the back or sides. One species, the lob-worm, is greatly prized in Europe for fish bait. The eunice, another species, has been known to reach the length of 4 feet.

DOSITHEANS, named after their founder Dositheus, who was a companion of Simon Magus, in the 1st c. A.D. Various stories are told of Dositheus; that he claimed to be the Messiah, and that after the death of John the Baptist, he assumed to take the place of that leader. The Samaritan high-priest ordered his arrest, when he took refuge in a cave, and is said to have starved to death.

DOUAY, **CHARLES ABEL**, 1809-70; a native of France; graduate of the military academy of St. Cyr; served in the war in Algiers, and in the Crimea, where he was conspicuous in the attack on the Malakoff. For services in the battle of Solferino he was made gen. of division. In the German war he commanded at Weissenburg, where he was defeated by the crown prince Frederick William, and found dead on the battlefield.

DOUAY, **FÉLIX CHARLES**, 1818-79; brother of Charles Abel; served as a capt. in the siege of Rome in 1849, and in the Crimean war, where he rose to brig.gen. He was in Mexico with Maximilian, serving as gen. of division. In the Franco-German war, he led the 7th army corps, and was taken prisoner at Sedan. In Paris, he led the 4th army corps against the commune. He was the first to enter Paris, May 21, and saved the Louvre from entire destruction. His latest command was the military district of the Rhone.

DOUBLEDAY, **ABNER**, b. N. Y., 1819; graduate of West Point, and a civil engineer. In the Mexican war, he served in the artillery, and became capt. It is said that he fired the first gun on the union side in the war of the rebellion, at Fort Sumter, April 12, 1861. He served with honor through the war, and rose to be brevet maj.gen.

DOUBLE REFRACTION. If a crystal of pure carbonate of lime, known as Iceland spar, be laid over a printed page, two distinct views of the letters will be seen through the transparent stone. The letters in the two images will have a fainter color than the original, except when the two images overlap. The production of two images

in this manner is called double refraction. If the crystal is made to rotate while always in contact with the paper, one of the images of a dot will be seen to rotate, while one remains unmoved. The stationary image is called the ordinary, the moving one the extraordinary image. The rays which form the ordinary image follow the common law of refraction of light. The others have a different index of refraction. Other crystals besides Iceland spar are doubly refractive. For an elaborate demonstration of the causes of this effect, see Lloyd's *Wave Theory of Light*, London, 1873.

DOUBLE STARS. As seen by the naked eye all stars appear to be single, but the telescope shows us that many are double, while it resolves others into several distinct bodies. In some instances telescopes of low power suffice to reveal the separation; others require instruments of the largest kind and very delicate adjustment. The object-glass especially needs to be free from all defects. Sometimes one of the components of a double star may hide another from view, and in other instance, while they are apparently near, they may yet be far from each other in almost the same line of sight. In certain cases, Herschel found that one of the components described an orbit about the other. A star which is single to ordinary vision, but which may be resolved into two stars thus physically related, is called a binary star. The components of the same star are almost invariably of a different color. The colors of some double stars, however, are complementary, producing together white light. Eight of the stars known to be physically double have periods of revolution less than a century, while about 400 appear to have a period of more than 1000 years for this process.

DOUGHERTY, a co. in s.w. Georgia, on Flint river; crossed by two railroads; 300 sq.m.; pop. '70, 11,517—9,424 colored. It is level and fertile, producing corn, oats, cotton, etc. Co. seat, Albany.

DOUGLAS, a co. in n.e. Colorado, on the Kansas border; traversed by the Kansas Pacific and the Denver and Rio Grande railroads; 4,500 sq.m.; pop. '70, 1388. The bottom-lands are fertile; other parts are more adapted to grazing. Coal and iron are found. Productions chiefly agricultural. Co. seat, Castle Rock.

DOUGLAS, a co. in s.e. Dakota, formed after the census of 1870; about 500 sq. miles. It is not yet settled.

DOUGLAS, a co. in n.w. Georgia, formed after the census of 1870. It is on the Chattahoochee river, and has an area of about 300 sq. miles. Cotton and corn are the chief productions, and minerals are found. Co. seat, Douglasville.

DOUGLAS, a co. in e. Illinois, on Kaskaskia and Embarras rivers; intersected by the Chicago division of the Illinois Central railroad; 375 sq.m.; pop. '70, 13,484. It has a level surface and fertile soil, producing corn, oats, wheat, wool, and butter. Co. seat, Tuscola.

DOUGLAS, a co. in e. Kansas, on the Kansas river; intersected by the Leavenworth, Lawrence, and Galveston railroad; 470 sq.m.; pop. '78, 18,971. It is of rolling upland, with a black loamy soil, producing corn, wheat, butter, etc. Co. seat, Lawrence.

DOUGLAS, a co. in w. Minnesota, reached by the (proposed) St. Paul and Pacific railroad; 720 sq.m.; pop. '75, 6,319. The surface is mostly level, and there are many small lakes. Productions agricultural. Co. seat, Alexander.

DOUGLAS, a co. in s. Missouri, on the upper waters of the White river; 648 sq.m.; pop. '70, 3,915. The surface is hilly, much of it still covered with forests. Lead ore is found. The productions are chiefly agricultural. Co. seat, Ava.

DOUGLAS, a co. in e. Nebraska, on the Missouri river, bounded on the w. by the Platte; traversed by the Union Pacific and the Omaha and Southwestern railroads; 350 sq.m.; pop. '76, 25,722. The soil is fertile, and the surface an undulating prairie. Productions agricultural. Co. seat, Omaha.

DOUGLAS, a co. in w. Nevada, on the California border; 900 sq.m.; pop. '75, 1718. It is a rough region, but embraces the most fertile portion of the Carson valley. There are pine forests in the mountains, and water-power is abundant. Gold, silver, and copper are found, but mining is not prosecuted to any great extent. Productions agricultural. Co. seat, Genoa.

DOUGLAS, a co. in s. Oregon, on the Umpqua river; crossed by the Oregon and California railroads; 5,000 sq.m.; pop. '75, 6,033. Productions, wheat, corn, barley, butter, wool, etc. Co. seat, Roseburg.

DOUGLAS, a co. in n.w. Wisconsin, on lake Superior and the Minnesota border, reached by the Lake Superior and Mississippi railroad; 1300 sq.m.; pop. '75, 741. Agriculture is the principal business. Co. seat, Superior.

DOUGLAS, DAVID, 1798—1834; a botanist, native of Scotland. He was employed in the Glasgow botanic garden for a time; then sent abroad as collector of specimens for the botanical society of London. In 1824, he explored a great part of Oregon and California, and in 1827, crossed the continent from fort Vancouver to Hudson bay, returning with sir John Franklin to England. In 1829, he visited the Sandwich islands, where, falling into a pit for entrapping wild cattle, he was gored to death by an animal already caught.

DOUGLAS, STEPHEN ARNOLD, 1813-61; a statesman; b. Brandon, Vt., d. Chicago. His father, a respectable physician, died when he was two months old, leaving the mother in straitened circumstances. The son lived with her on a farm until he was 15 years old, when he apprenticed himself to a cabinet-maker. Before the end of two years his health failed and he abandoned his occupation. After attending Brandon academy for one year, he removed with his mother to Canandaigua, N. Y., and resumed his studies in the academy there, at the same time beginning to prepare himself for the legal profession. In 1833, he went to Winchester, Ill., walking a part of the way for lack of funds, and opened a school, which he taught for three months, still pursuing his studies for the bar. In 1834, he was admitted to practice and within a year was elected attorney-general for the state. He resigned this office, Dec., 1835, on being elected a member of the legislature. In 1837, he was appointed register of the United States land office at Springfield, but resigned in 1839. In 1837, he was nominated for member of congress by the democratic party, and came very near an election. In 1840, he was appointed secretary of state of Illinois. In 1841, he was elected a judge of the supreme court of the state by the legislature, but resigned in 1843 to become again a candidate for congress. He was elected this time by over 400 majority, and re-elected for two successive terms. He resigned after his election for the third time, to accept the post of senator of the United States for six years from Mar. 4, 1847. As a member of the house of representatives, he took an active part in the political discussions of the time. In the Oregon controversy he took extreme ground against Great Britain, claiming the whole territory for the United States up to lat. 54° 40'. He was also an earnest advocate for the annexation of Texas, and as chairman of the committee on territories, 1846, reported the joint resolution declaring that country to be one of the states of the American union. He was an ardent supporter of president Polk in the war with Mexico. The bills to organize the territories of Minnesota, Oregon, New Mexico, Utah, Washington, Kansas, and Nebraska, were all reported by him, as were also those providing for the admission to the union of the states of Iowa, Wisconsin, California, Minnesota, and Oregon. He was a strenuous opponent of the "Wilmot proviso," and of every other measure for resisting the extension of slavery by federal action, holding to the doctrine called "squatter sovereignty"—the doctrine, in other words, that the settlers in a territory had the right to say whether they would have slavery or not. In Aug., 1848, however, he so far relinquished this doctrine as to propose an amendment to the Oregon bill, extending the Missouri compromise line of 36° 30' to the Pacific, thus prohibiting slavery in the region n. of that line, and recognizing it in that s. thereof. The amendment prevailed in the senate, but was lost in the house of representatives. The land was now filled with excitement upon the slavery question, and the compromise measures of 1850 were devised and passed as a "final settlement" of the controversy. Instead of quieting the agitation, however, they fanned it to an intenser heat. In 1852, D. was an unsuccessful candidate for the democratic nomination for president of the United States. During the congressional session of 1853-54, he reported the bill to organize the territories of Kansas and Nebraska, the freedom of which from slavery was solemnly guaranteed by the Missouri compromise of 1820. This restriction Douglas now proposed to repeal or disregard, leaving those territories under the doctrine of "squatter sovereignty," open to the introduction of slavery. The enactment of this measure created intense excitement in the northern states, and D. was hotly denounced. From this time forward the question of the extension or non-extension of slavery was the paramount issue before the country—the compromise measures of 1850 proving utterly abortive as a means of stopping anti-slavery agitation. In 1856, D. was again a candidate for the presidential nomination of his party, but James Buchanan gained the nomination. In 1853, desiring a re-election to the senate, he engaged in a political canvass of the state of Illinois—Abraham Lincoln, the republican candidate for senator, being his antagonist. They spoke from the same platform in regular debate, upon conditions mutually agreed to, in every quarter of the state. A majority of the popular vote was cast against him, but D. carried the legislature by a small majority, and was consequently re-elected to the senate. He was in favor of the annexation of Cuba to the United States, and a warm champion of the Pacific railroad. In the presidential election of 1860, the democratic party was divided, D. being supported by the northern and Breckenridge by the southern section. The republicans nominated and elected Abraham Lincoln. After the beginning of the war of the rebellion, D. took strong ground in favor of the union, giving his influence to uphold the general government. During his last illness, he dictated for publication a letter in which he declared it to be the duty of all patriotic men to sustain the union, the constitution, the government, and the flag, against all assailants. He was short of stature, but stoutly built, and was familiarly called "the little giant." He was endowed with qualities which gave him great power over masses of men. His first wife (1847) was Martha, daughter of col. Robert Martin of Rockingham co., N. C.; his second, Adele, daughter of James Madison Cutts of Washington. By his first wife he had three children, the eldest of whom, Robert Martin Douglas, was for a time private secretary of president Grant.

DOUGLASS, DAVID BATES, 1790-1849; b. N. J.; graduate of Yale, 1813. He went into the army, and was one of the defenders of fort Erie, for which he was brevetted cap-

tain. In 1815, he was assistant professor of natural and experimental philosophy at West Point; in 1819, astronomical surveyor in fixing the boundary with Canada from Niagara to Detroit, and the next year in the same capacity further west. In 1832, he accepted the professorship of civil architecture in the university of New York, and prepared the designs for the building on Washington square. He surveyed the region of Croton river, with a view to a supply of water for the city; his plan was accepted, and he was appointed chief engineer. In 1839, he planned and laid out Greenwood cemetery. From 1841 to 1844, he was president of Kenyon college. In after years he laid out cemeteries at Albany and Quebec. His last official position was professor of mathematics and natural philosophy in Hobart college.

DOUROUCOULI, a small monkey of Brazil, sleeping by day but active and fierce at night in pursuit of birds and insects. The body is only about 9 in. long, the tail 14; fur soft and grayish white, with a brown stripe down the back. The douroucoul looks more like a cat than a monkey, and sits up like a dog. It has a harsh disagreeable voice, and is difficult to domesticate.

DOUSA, JANUS, (JAN VAN DER DOES), 1545-1604; a Dutch statesman, historian, poet, and philologist, the defender of Leyden. He studied at Douay, Paris, and in other cities, and became friendly with many eminent scholars. In 1572, he was sent as ambassador to England, and in 1574, was charged with the government and defense of Leyden, then besieged by the Spaniards. When the university of Leyden was founded he was appointed first curator. In 1585, he was sent to England to solicit assistance from queen Elizabeth. In 1591, he was a member of the states-general. His principal work was the *Annals of Holland*.

DO'VE, RICHARD WILHELM, b. Berlin, in 1833; 1862, professor in the university of Tübingen; in 1865, at Kiel, and in 1868, at Göttingen. He was a member of the Reichsrath in 1871, and sided with the liberals. In 1860, he established and began to edit the well-known periodical, *Zeitschrift für Kirchenrecht*, a leading European publication on ecclesiastical law. He still writes for this magazine.

DOVER, the capital of Delaware; in Kent co., on Jones river and the Delaware railroad; 77 m. s. of Philadelphia; pop. '70, 6,394—1839 colored. It is regularly built, with straight, wide, well-shaded streets, crossing at right angles. There are some fine public edifices, notably the city hall, post-office, and court-house; and there is considerable manufacturing industry.

DOVER (*ante*), the seat of justice of Strafford co., N. H., on the Cochecho, 2 m. above its junction with the Piscataqua, 12 m. from Portsmouth, on the Boston and Maine railroad; pop. '80, 11,693. It is handsomely laid out, and has a great number of fine residences, and some imposing public buildings. Water-power is supplied by the Cochecho, which here has a fall of 32 ft., the dry season being provided for by a great reservoir. The chief business is the manufacturing of cotton, wool, leather, carriages, hats and caps, machinery, etc., in which probably 2,000 persons are engaged. There are excellent schools and a good city library. The place was settled in 1623, and is the oldest town in the state. Like most of the early settlements in New England, Dover suffered from Indian attacks. In 1698, 23 of the people were killed and 29 carried into captivity. The city charter dates from 1855.

DOVER, a t. in Morris co., N. J., on the Rockaway river, the Morris canal, and a branch of the Delaware, Lackawanna, and Western railroad; pop. about 2,000. It is the center of an iron-mining region, and the people are largely engaged in the mining and manufacturing of that material. There are also other manufactures. The surrounding scenery is beautiful.

DOW, LORENZO, 1777-1834; b. Conn.; an American preacher of limited education, noted for his eccentricities as well as zeal. In youth he was in much perplexity about religion, but finally joined the Methodists, and for a short time was a preacher in that denomination, which he left under a conviction that he was called to be a missionary to the Roman Catholics of Ireland. His preaching in that country attracted crowds of people, and brought him some persecution. He also visited England, introducing there the system of camp-meetings, which is still popular among the Methodists. After returning to the United States for a time, he repeated his visits to Ireland and England in 1805. He afterwards preached for many years in the United States, traveling all over the country, and sometimes making appointments a year in advance, which he filled at the exact day and hour. His natural eloquence and his eccentricities of dress and speech attracted large audiences everywhere. He preached much against the Jesuits, whom he regarded as conspirators against civil and religious liberty. His *Polemical Works* appeared in 1814. Among his other writings are *The Stranger in Charleston*, or the *Trial and Confession of Lorenzo Dow*; *A Short Account of a Long Travel*; and the *History of a Cosmopolite*—the cosmopolite being himself.

DOW, NEAL, a temperance reformer, b. Me., 1803. He is the author of what is known as the "Maine Law," prohibiting the sale of intoxicating drinks in that state under severe penalties, in operation since 1851. He was a brig. gen. of volunteers in the war for the suppression of the rebellion, and was taken prisoner near Port Hudson in 1863. He is still an uncompromising opposer of strong drink even as moderately used.

DOWER (*ante*), the legal term by which is expressed the prescriptive right of a wife in the estate of her deceased husband. The term is derived from the English common law, the provisions of which, in this respect, have undergone many changes since the ancient days. As a general rule, in the United States, the widow's dower includes a right for life to the use of one third of the lands of which her husband died possessed, and of the profits arising therefrom. A wife may waive her right by the acceptance in lieu thereof of a jointure or some other provision made by will, or she may join her husband in a conveyance of the estate in some form prescribed by law. She may be barred by marital infidelity. In some states, in case of divorce for the husband's fault, the wife takes her dower immediately as if he were dead. The laws on this subject in the different states are far from uniform, and they are constantly subject to change. In some states the right of dower is not merely a right of use, but an estate in fee; in others, dower is barred by judicial sale for the enforcement of a debt or contract.

DOWLER, BENNET, a physician, b. Va., 1797; educated at the medical school of the university of Maryland; settled in New Orleans in 1836, where his professional standing is high. He was for some years the editor of the *New Orleans Medical and Surgical Journal*. He is the author of a *Tableau of the Yellow Fever of 1853*, and of various contributions to the periodical literature of the profession. He founded the New Orleans academy of sciences. He has performed many experiments upon the human body immediately after death, the results of which are deemed valuable.

DOWNCAST, the name of a shaft used for ventilating mines. The foul air is made to ascend through a flue by a fire burning at the bottom, while fresh air descends through the downcast.

DOWNES, JOHN, 1786-1855, b. Mass.; an American naval officer. He entered the navy in 1802, and was in the frigate *New York* as midshipman during the war with Tripoli, distinguishing himself by gallant service. He was made a lieutenant in 1807, and served as such on board the frigate *Essex* against the British, under capt. Porter, 1812-14, who assigned him to the command of the cruiser *Essex Junior*. In 1815, he commanded the brig *Epervier*, under Decatur, in the war against Algiers, and assisted in taking an Algerine pirate; also in capturing the Algerine brig *Estido*. In 1817, he was made captain, and commanded the frigate *Macedonian* in the Pacific, 1819-21. In 1828-29, he served in the Mediterranean squadron, and 1832-34 he was with the squadron in the Pacific. In 1837, he was appointed commander of the navy-yard in Charlestown, serving till 1842. He filled the same post again, 1850-52.

DOWNING, ANDREW JACKSON, 1815-52; b. N. Y.; a pomologist and landscape gardener. In his chosen department he showed a fine taste, and introduced great and lasting improvements, developing a public appreciation of harmonious landscape decoration. He was drowned in the Hudson river when the steamer *Henry Clay* was burned. His works are *A Treatise on the Theory and Practice of Landscape Gardening*, and *Fruit and Fruit Trees of America*, both highly esteemed. He was for a time editor of the *Horticulturist*, published in Albany. A volume of his *Rural Essays*, with a memoir by George Wm. Curtis, was published after his death.

DRACÆNA DRACO, or **DRAGON TREE**, of the order *liliaceæ*, producing the resin called dragon's blood. Its thickness is greatly out of proportion to its height. The head is crowned with short branches bearing tufts of sword-shaped leaves. Humboldt saw a tree in Teneriffe which for 400 years had measured 45 ft. in circumference. The Guanches worshiped it, and had hollowed its trunk into a small sanctuary.

DRACUT, a t. in Middlesex co., Mass., on the Merrimack, opposite Lowell, with which it is connected with bridges. The town borders on New Hampshire. Agriculture is the main business, but there are also some manufactures of woolens, paper, etc.

DRAKE, DANIEL, 1785-1852; a physician; b. N. J.; graduated at the university of Pennsylvania, 1816. In 1818, he founded a medical college in Cincinnati; also a commercial hospital. In 1823, and following years, he was professor in medical colleges in Philadelphia, Louisville, and Cincinnati. He wrote *An Historical and Scientific Account of Cincinnati*; and *A Systematic Treatise, historical, etiological, and practical, on the Principal Diseases of the Interior Valley of North America, as they appear in the Caucasian, African, Indian, and Esquimaux varieties of its Population*.

DRAKE, JOSEPH RODMAN, 1795-1820; b. N. Y.; one of the early American poets. He studied medicine, graduated, and married a daughter of Henry Eckford, the ship-builder, an alliance which raised him from poverty to affluence. In 1816, he wrote *The Outpost Pay*, a highly imaginative poem. In 1818, he was in Europe. The next year, in conjunction with Fitz-Greene Halleck, he wrote poetical satires for the *New York Evening Post*, over the signature of "Croaker and Co." He is best known as the author of *The American Flag* (of which Halleck is said to have contributed the last four lines), which many critics consider to be our best national poem.

DRAKE, SAMUEL GARDNER, 1798-1875; b. N. H.; in early life a school-teacher. In 1828, he established in Boston an antiquarian bookstore, the first of the kind in the country. He was one of the founders of the New England historical and geological society, of which he was president in 1858. In 1847, he started a quarterly *Register*, of

which he was for many years the editor. Among his publications are a number of books on Indian history and wars, on genealogy, and on witchcraft; but the most important is his very full *Dictionary of American Biography, including Men of the Time*, containing 10,000 notices of persons of both sexes, of native and foreign birth, who have been remarkable or prominently connected with the arts, sciences, literature, politics, or history of the American continent.

DRAMA (ante). In the United States it is difficult to separate the English and American drama. The sameness of language, the similarity of dramatic themes, and the free and constant intermingling professionally of American and English artists, make a homogeneous whole rather than separate branches. The literature of the drama in the United States is very extensive; but, as in England, a great proportion of it is of little value. It was some time after the establishment of independence before the dramatic muse began to work; and the earliest productions were naturally based upon our warlike achievements, the glories of our battle-fields, the invincible courage of our heroes, and the ignominious defeats of the enemy. It scarcely needs be said that such dramas, following like shadows upon events so recently passed, were veritable trash, not only in a literary but in an acting view. Centuries must roll by ere Lexington, and Saratoga, and Yorktown can become fit subjects for dramatic treatment. Shakespeare's historical plays took little hold of the English public until Garrick entered into the body and soul of Richard III., three hundred years after Bosworth field and a century after the death of the swan of Avon. The first theater to open after the departure of the British troops was that in John street, New York, 1785. All the players of note were English, and so were the plays. The first play by an American author presented on the stage was *Contrast*, written by Royal Tyler, afterwards chief-justice of Vermont. It was a poor affair, but served to introduce to the boards that abomination known as the exaggerated "Yankee," which could not be banished for three quarters of a century. William Dunlap was the first prolific American dramatist, some of whose work was fair for the period, while much more of it was poor. He produced about fifty plays, some of which were translated from the German. The building of the Park theater, New York (opened Jan. 29, 1798), gave the drama a fresh start, although all the chief players were from the old country, and the opening play was *As You Like It*. On Jan. 24, 1809, "the American Roscius" made his debut on the Park stage as "Young Norval," following with more solid characters. This lad was John Howard Payne. He wrote and translated a number of plays, of which his own tragedy *Brutus, or the Fall of Tarquin*, still keeps the stage. It is a powerful, well-constructed tragedy, and bears comparison with those of any English writer excepting only Shakespeare; moreover, it is the first drama of importance written by an American author. It was not until about 1820, that literary and cultured people began to look with favor upon the drama. The Park theater was burned in May of that year, but was rebuilt and opened in Sept., 1821, when Charles Sprague, then among the foremost of native poets, wrote the inaugural address, and Samuel Woodworth, another poet of high standing and also a dramatist, wrote the prize poem. Soon after this period, play-houses began to multiply, and the solid phalanx of English artists was now and then broken by the invasion of American players, none of them, however, destined to achieve greatness. There were some who rose to local celebrity; such as Rosalie Pelby, Anne Jane Henry, Caroline Placide, Alexina Fisher, then a mere child, and Julia Wheatley, a singer. Further impetus was given to the American drama by the presence of the great tragedian Edmund Kean, who played two short engagements in New York and Philadelphia. Opera also began to appear in force under Signor Garcia and his daughter Felicite, afterwards the renowned Malibran. In 1826, James K. Hackett made his first appearance as "Sylvester Daggerwood." He became famous in "Falstaff" and "Monsieur Tonson," in Yankee parts, and especially in "Sir Harcourt Courtly." Kean was hardly gone when Edwin Forrest made his first effort in a Shakespearean part as "Othello," June 24, 1826. Forrest is held in memory by a large majority of his countrymen as the greatest of American tragedians. The two Wheatley families (one English and one American) were coming into prominence about this period. Forrest, always intensely American in feeling, undertook to infuse the native idea into his work. He appeared in John A. Stone's *Metamora* (written for Forrest), and especially engaged Dr. Bird of Philadelphia to write a new play. The result was *The Gladiator*, a Roman episode removed as far as possible from this new world. Bird also wrote *Oyalosa*, another Indian piece. Stone was a native of Massachusetts, and the author of *Fauntleroy*; *Tancred of Sicily*; *Laroque, the Regicide*; and other dramas. He committed suicide when but 33 years of age. In 1830-31, two noted delineators of Yankee parts appeared in Danford Marble and George H. Hill, and were popular in a low grade of plays for many years. The season of 1832-33 brought over Charles and Fanny Kemble, who enjoyed immense popularity. The year before, the celebrated Ravel family had taken the people by storm, but they had no connection with the drama. In the spring of 1833, again appeared the great and erratic Booth, father of Edwin. He had appeared first in the United States, Oct., 1821. "Master Burke," or Charles S. T. Burke, one of the best of American comedians, appeared in 1836. In the same year, Misses E. and J. Anderson, granddaughters of the first Joseph Jefferson, made a successful beginning. The first became successively Mrs. Thoman and Mrs. Saunders, and the other Mrs. Ger-

mon, mother of Effie, artists by birth. Nathaniel H. Bannister, a native of Delaware, started in 1813, and acquired considerable reputation, both as actor and dramatic author. Then came a mere boy, at the obscure National theater, one destined to be the foremost of American comedians—Joseph Jefferson, son of Joseph, grandson of the first Joseph, and half-brother of Charles Burke. These great artists illustrate the truth of hereditary transmission. About this time, James E. Murdoch, a Philadelphian, began to make his mark in tragedy. In 1836, appeared Miss Jean Margaret Davenport, an infant phenomenon. She became the wife of col. Frederick W. Lauder, and during the war of the rebellion she was a devoted nurse in the hospitals of the union army. Charlotte Cushman, the greatest of American actresses, now threw the light of her powerful genius and individuality upon the stage. In 1838, Mary Cecilia Taylor ("our Mary") made her début, and became perhaps the most popular favorite ever known in New York city—a very clever and versatile though not a great actress. "The Shaws," as three talented sisters were called, were now coming prominently forward. They were Regina (first, Mrs. Charles Howard, and then Mrs. H. Watkins), Mary (first, Mrs. Fogg, and then Mrs. Krollman), and Josephine (first, Mrs. Russel, and then Mrs. John Hoey). All had more than ordinary talents, and were great favorites. Edward Eddy, b. in Troy, N. Y., appeared in 1839; a very heavy tragedian and melodramatic actor. In the same period came Joseph Proctor and his wife (Miss Hester Warren). John Gilbert first appeared in New York in 1839, and has ripened into the most accomplished "old man" on any stage. He was born in Boston in 1810, and made his début there in 1828.

Thus we struggled on with English plays and English players, except as above mentioned, until John Brougham, an Irishman, came over (in 1842) to stay. He was the first author to put life into the play-bills. Though not born here, his work was essentially American, especially those inimitable burlesques, *Pocahontas* and *Columbus*. He was also the best Irish and general comedian of the day. In June, 1844, a bright particular star appeared in the person of Anna Cora Mowatt, who was for several years the reigning favorite in genteel comedy and light tragedy. Only a few months before, Edward L. Davenport had made his mark, and he supported the rising actress in a successful tour. Davenport was an actor of great versatility, taking almost anything from "Hamlet" to "Bill Sykes." He was a native of Boston. Another welcome addition to the stage was Julia Dean, a native of New York, whose line was much like that of Mrs. Mowatt. John Lester Wallack (born here of English parents) made his first appearance in 1847. He is a worthy successor of his father, James W. Wallack, and a fit representative of a family that have shed luster upon the stage. In Dec., 1849, the "Batenau children" (Kate, aged 6, and Ellen, aged 4) appeared as dramatic prodigies. Ellen did not long remain on the stage, but Kate Josephine (Mrs. Crowe) became one of the foremost of American actresses, and had great success in England. In 1850, George L. Fox, low comedian, and afterwards pantomimist, began a successful career.

Besides the American artists already mentioned, we must name (with some repetitions) Joseph Jefferson (3d) the first in comedy and pathos, William Warren, Edwin Booth (first in tragedy, and who seems to have touched perfection in the illustration of his select Shakespearean characters), A. A. Addams, Lawrence Barrett, Mrs. D. P. Bowers, John McCullough, Frank S. Chanfrau, John S. Clarke, Edwin Adams, J. M. Field, Mary Gannon, Mrs. Barrett, Matilda Heron, George Jamison, Frank Mayo, John E. Owens, John T. Raymond, John R. Scott, Daniel E. Setchell, Mark Smith, Charlotte Thompson, William J. Florence, Maggie Mitchell; and many others might be added. America is much stronger in players than in plays. Even Payne's tragedy of *Brutus* is made up of foreign materials. Some of the play-writers who have been most prominent are William Dunlap, David Paul Brown, Robert M. Bird, Nathaniel H. Bannister, Robert T. Conrad, George H. Boker, Epes Sargent, Dr. J. S. Jones, and Dr. W. K. Northall. Mrs. Mowatt, the actress, wrote *Fashion* and *Armand*. J. Wilkins wrote *Civilization*, and has not since been heard from in authorship. Julia Ward Howe has written for the stage. Harriet Beecher Stowe is hardly a dramatist, but her powerfully dramatic story of *Uncle Tom's Cabin*, which needed little except cutting down to fit it for the stage, has had far greater popularity than any other drama ever produced in America. Nathaniel P. Willis wrote tragedies; George H. Boker has done the same. Among American writers in 1880 are Bartley Campbell and Bronson Howard. Dion Boucicault, though not an American citizen, has produced in this country plays which have had popularity. There is a vast accumulation of trash in the green-room, crudely patched up by players themselves, and by third-rate writers who make plays to order as a cordwainer makes shoes. There is much cheap translation and adaptation of French plays, which often remain quite unadapted to a true American taste. So long as English and French authors fill the popular demand, the American stage will depend largely upon foreign supply. Still, America is growing in intellectual independence; and, considering the fact that the people are in one sense English, and the nation too new to furnish home material for historical dramas, its progress thus far is at least moderately good. There is a peculiar class of dramas that are as redolent of the American soil as *Jack Sheppard* and *Oliver Twist* are of that of old England. Such are the sensational pictures of Indian and border life, full of powder and blood and bowie-knives and exciting situations, but utterly worthless in a literary or artistic view. As concerns artists, we have sent to the mother country men and women who fairly balance

our obligation for the Keans and the lesser lights from time to time sent to us across the ocean.

DRAMBURG, a t. in the province of Pomerania, Prussia; 53 m. e. of Stettin; pop. about 5,626. There are in the place a number of manufactories, a normal school, and a gymnasium.

DRANESVILLE, a village in Halifax co., Va., about 20 m. n.w. of Washington. A battle was fought here, Dec. 20, 1861, between the unionists and the confederates. It was an artillery duel, important only as the first success gained by the union army of the Potomac.

DRAPIER LETTERS, written by Dean Swift over the signature "M. B. Drapier," in which he counseled the people of Ireland not to receive the money coined by William Wood, to whom the English government had granted a patent in 1722 to supply a deficiency in the coinage of that country, of more than \$500,000. The letters made a great sensation in Ireland, and caused the patent to be canceled, but not until about \$400,000 in half-pence had been coined. Popular feeling was so intense at the time, that Wood was forced to leave the country.

DRAYTON, WILLIAM HENRY, 1742-79; b. S. C.; educated at Oxford, England. In 1771, he was privy counselor of South Carolina; but when the revolution began, he espoused the popular cause, and became a member of the committee of safety. In 1775, he was president of the provincial congress, and the next year was elected chief justice of South Carolina. He was a prominent member of the continental congress until his death. He left a minute narrative of the current events of the revolution.

DREBBEL, CORNELIS VAN, 1572-1634; a Dutch inventor of whose life little is known. He seems to have been a favorite at court, and tutor to the son of Ferdinand II. In the thirty years' war he was arrested and saved from execution only through interference of James I. of England. After 1620, he resided in London, where, it is said, he invented the compound microscope and an air thermometer with its bulb filled with water. It was reported also that he showed the king a glass globe in which, by means of the four elements, he had produced perpetual motion; and that by means of other machinery he imitated lightning, thunder, rain, and cold, and was able to speedily exhaust a river or lake. He made some discoveries in dyes, which were used by the founders of the Gobelin manufactures.

DREDGE (*ante*). Naturalists use an instrument constructed on the general plan of an oyster-dredge for obtaining specimens of animals living at the bottom of the sea, to determine their structure and geographical distribution. In working, the dredge is slipped gently over the side of the boat, either from the bow or the stern. When it reaches the bottom and begins to scrape, an experienced hand upon the rope can usually detect by the tremor of the line when the dredge is passing over an irregular surface. The boat should move not more than a mile in an hour. The dredge may remain down from 15 to 20 minutes, within which time, in favorable circumstances, it may be fairly filled. It comes up variously freighted, according to the locality, and the contents are examined. The scientific value of dredging depends mainly upon two things: the care with which objects procured are preserved and labeled for future identification, and the accuracy with which all the circumstances of the dredging—the position, the depth, the nature of the ground, the date, temperature, etc.—are recorded.

Until the middle of the 18th c. the little that was known of the inhabitants of the sea beyond low-water mark seems to have been gathered almost entirely from objects thrown on the beach after storms, and from the chance captures of fishermen. The dredge was used to aid natural history, first by Otto Frederick Müller, in the researches which furnished material for his *Descriptions and History of the rarer and less known Animals of Denmark and Norway*, 1779. Thenceforward much advance was made in knowledge of deep-sea life, mainly by the efforts of the British association; but the first important undertaking was in the winter of 1872. At that time *The Challenger*, a steam-corvette of 2,306 tons, and 1234 horse-power, was sent out to investigate the physical and biological conditions of the great ocean basins. This vessel was thoroughly equipped, and carried a corps of distinguished scientists. Dredging was done from the main yard-arm. A strong pendant was attached by a hook to the cap of the main-mast, and, by a tackle to the yard-arm, a compound arrangement of 55 to 70 of Hodge's patent accumulators was hung to the pendant, and beneath it a block through which the dredging-rope passed. The donkey-engines for hauling in the dredging and sounding gear were placed at the foot of the main-mast on the port side. They consisted of a pair of direct-acting high-pressure horizontal engines, in combination of 18-horse power nominal. Instead of a connecting rod to each, a guide was fixed to the end of the piston-rod, with a brass block working up and down the slot of the guide. The crank axles ran through the center of the blocks, and the movable block, obtaining a backward and forward motion from the piston-rod, acting on the crank as a connecting rod would do. This style of engine is commonly used for pumping, the pump-ropes being attached to the guide on the opposite side from the piston-rod. At one end of the crank a small toothed wheel was attached, which drove one thrice the multiple on a

horizontal shaft extending nearly across the deck, and about 3 ft. and 6 in. above it. At each end of this shaft a large and small drum were fixed, the larger having three sheaves cast upon it of different sizes; the small being a common barrel only. To these drums the line was led, two or three turns being taken round the drum selected. In hauling in, the dredging-rope was taken to a gin-block secured to a spar on the fore-castle, then aft to the drum of the donkey-engine on the port side, then to a leading-block on the port side of the quarter-deck, and across the deck to a leading-block on the starboard side corresponding in diameter with the drum used on the port side, and from this it was finally taken by the hands and coiled. The strain is of course greatest at the yard-arm and the first leading-block, and by this arrangement it is gradually diminished as the line passes round the series of blocks and sheaves. A change made latterly in the handling of the dredge had certain advantages. Instead of attaching the weights directly to the dredge-rope, and sending them down with the dredge, a "toggle," a small spindle-shaped piece of hard wood, was attached transversely to a rope at the required distance, 200 to 300 fathoms in advance of the dredge. A "messenger," consisting of a figure of eight of rope, with two large thimbles in the loops, had one of its thimbles slipped over the chain before the dredge was hung, and the other thimble made fast to a lizard. When the dredge was well down and had taken its direction from the drift of the ship, the weights, usually six 28-lb. deep-sea leads in three canvas covers, were attached to the other thimble of the traveler, which was then cut adrift from the lizard and allowed to spin down the line until it was brought up by the toggle. By this plan the dredge took a somewhat longer time to go down; but after it was adopted not a single case occurred of the fouling of the dredge in the dredge-rope, a misadventure which had occurred more than once before, and which was attributed to the weights getting ahead of the dredge in going down, and pulling it down upon them entangled in the double part of the line.

The great risk in dredging in very deep water is that of the dredge running down nearly vertically and sinking at once into the soft mud, and remaining imbedded until hauling in commences. During the earlier part of the voyage of the *Challenger* this accident frequently defeated, at least partially, the object of the operation; and, after various suggestions for modifying the dredge, it was proposed to try some form of the trawl in order to insure, so far as possible, the capture of any of the larger marine animals which might be present, and thus to gain a better general idea of the nature of the fauna. A 15-ft. beam-trawl was sent down off cape St. Vincent to a depth of 600 fathoms; the experiment looked hazardous, but the trawl duly came up, and contained, with many of the larger invertebrata, several fishes. The trawl seemed to answer so well that it was tried again a little further s. in 1090 fathoms, and again it was perfectly successful; and during the remainder of the voyage it was employed almost as frequently, and in nearly as deep water (3,125 fathoms in the Pacific), as Ball's dredge was in the Atlantic, where the deepest haul was at 3,150 fathoms. During the voyage of the *Challenger*, a course of about 70,000 nautical miles was traversed in three years and a half, and 362 observing stations were established at intervals as nearly uniform as circumstances would permit; and at the greater number of these, dredging or some modification of the process was successfully performed—52 times at a depth greater than 2,000 fathoms, and thrice at depths beyond 3,000 fathoms. So fully convinced were the *Challenger* officers that they could dredge at any depth, that it was only want of time and daylight which prevented their doing so at their deepest sounding, 4,575 fathoms. The Atlantic was crossed five times, and an erratic route through the Pacific gave a good idea of the conditions of the abysses of that ocean, while in the s. Indian ocean dredging and trawling were carried down close to the Antarctic ice-barrier.

The results of this expedition were of the most interesting nature. Animal life was found to exist at all depths, although probably in diminishing abundance as the depth becomes extreme; and in various parts of the world at depths beyond 400 or 500 fathoms the fauna had much the same general character. The species usually differed in widely separated areas, but the great majority of forms, if not identical, were so nearly allied that they might be regarded as representative and genetically related. Although all marine invertebrate classes were represented, echinoderms in their different orders, sponges and crustacea preponderated, while corals and mollusca were comparatively scarce. In the two groups first named, many forms occurred allied to families which had been previously regarded as extinct or nearly so; thus among the echinoderms, stalked crinoids were by no means rare, and many species of regular *echinidea* related to the chalk genus *echinothuria*, and many irregular species allied to *ananchytes* and *dysaster*, occurred. The sponges were mainly represented by the *hexactinellida*, the beautiful order to which the glass-rope sponge of Japan and the marvelous "Venus's flower-basket" of the Philippines belong, the order to which the ventriculites of the chalk must also be referred.

Dredging at its greatest depth is a difficult and critical operation, and although by its means some idea of the nature and distribution of the abyssal fauna of the ocean has already been attained, it will be long before the blanks are filled up; for of the area of 140,000,000 sq.m. forming the "abyssal province," the actual amount hitherto traversed by the naturalist's dredge may still be readily reckoned by the square yard. [The substance of this article is from *Encyclopædia Britannica*, ninth edition.]

DRELINCOURT, CHARLES, 1595-1669; a French Calvinistic minister at Langres, 1618. In 1620, he went to Paris, and was made minister of the church at Charenton. He wrote a large number of devotional works, which had a wide circulation. His *Catechism*, and *Consolations against the Fear of Death*, became well known in England. His controversial works were also numerous, and did much to consolidate the Protestant party of France. A number of his sons were distinguished as theologians or physicians.

DREW, a co. in n.e. Arkansas, on Bartholomew bayou, and the head waters of Saline river; area recently diminished to form another co.; pop. '70, 9,960—3,854 colored. It is level and fertile, much of it covered with cypress and ash forests. Productions: corn, cotton, etc. Co. seat, Monticello.

DREW, DANIEL, 1797-1879; b. N. Y. He began life as a drover and dealer in cattle; soon went into the steamboat business, and afterwards into railroads, and became known as one of the boldest and sharpest of speculators in stocks, winning and losing several fortunes. He was always interested in the prosperity of the Methodist Episcopal church, and in proof of that interest founded the Drew Ladies' seminary, at Carmel, N. Y. (his native town), and the Drew theological seminary, at Madison, N. J. Not long before his death he lost his estate.

DREW, SAMUEL, 1765-1833; a native of Cornwall, England, in early life a shoemaker. He became a zealous Methodist, and in 1799, published some *Remarks on Tom Payne's Age of Reason*. This was followed by *Remarks on Payne; Essay on the Immateriality and Immortality of the Soul; Essay on the Identity and General Resurrection of the Human Body; a History of Cornwall; and An Attempt to Demonstrate from Reason and Revelation the Necessary Existence, Essential Perfections, and Superintending Providence of an Eternal Being, who is the Creator, the Supporter, and the Governor of all Things*.

DREW THEOLOGICAL SEMINARY, for the education of Methodist ministers, was founded at Madison, N. J., in 1868, by Daniel Drew, a New York capitalist who gave an endowment of about \$500,000. It was organized under the supervision of the Rev. Dr. John McClintock, its first president. The institution is handsomely located, and in 1878, had six professors, and 104 students. J. F. Hurst, D. D., was the president.

DREYSE, JOHANN NIKOLAUS VON, 1787-1867; a native of Saxony, inventor of the needle-gun. He was the son of a locksmith, and followed the business, adding the manufacturing of tools. In 1836, he completed his invention of the needle-gun, which arm was a few years afterwards supplied to all the German troops. He and his family were ennobled in 1864.

DRISLER, HENRY, LL.D., b. 1818; graduated at Columbia college, 1839, and was instructor in the grammar school there for several years; then teacher of Greek and Latin; in 1845, adjunct professor in the same department; in 1857, professor of Latin, and in 1867, of Greek. In the latter year, during president Barnard's absence in Europe, he was president *pro tem.* of the college. He afterwards for several years assisted prof. Anthon in editing his classical text-books. Besides many minor contributions to linguistic study, he has edited (1846) Liddell and Scott's translation of Passow's Greek Lexicon, and (1870) an enlargement of Yonge's English-Greek Lexicon.

DROPSY (ante). It cannot be too clearly borne in mind that a dropsy is a transudation and not an exudation, and is not a direct product of inflammation, as the latter is. For instance, the fluid which is poured into the cavity of the pleura in pleurisy is not a dropsy, but an exudation of plastic material from the blood, which has the property of becoming organized into a kind of pseudo-tissue which forms adhesions between the lungs and the sides of the chest. In dropsy, the fluid has no power of organization, although it contains a slight portion of constituents of blood serum. Exudations have a turbid appearance when they are not colored with the red corpuscles of the blood, but the effused transuded fluid of dropsy is usually quite transparent, although sometimes tinged with the coloring matter of the blood. As a rule, dropsies are caused by obstructions to the return of blood by the veins, and may be general or local. In general dropsy there is an accumulation of watery fluid into the cellular tissue of a part or whole of the body, together with a transudation into one of the serous cavities. Such dropsies are apt to follow diseases of the heart (q.v.). Again, general dropsy may be owing to a morbid condition of the blood in diseases of the kidney (q.v.). It is then called *renal* dropsy, while that caused by disease of the heart is called *cardiac* dropsy. Local dropsies, when existing in the cellular tissue, are circumscribed. Thus, anasarca confined to the limbs would be called a local dropsy, whereas when spreading over the whole body it would be called general, although the cellular tissue only is invaded. For the causes of dropsy of the belly, or *ascites*, see more particularly LIVER, DISEASES OF THE. But ascites, as well as dropsy of other cavities than the peritoneum, may be the result of scarlet fever, which has for one of its sequelæ inflammation of the kidneys. The pressure of a tumor may cause dropsy. Pressure upon the portal vein may be followed by ascites; upon the ascending *vena cava*, or great vein which carries the blood from the trunk and lower extremities to the heart, anasarca of the trunk and lower extremities. When the pressure is upon one of the iliac veins, anasarca of one of the lower limbs is the consequence. The treatment of dropsy depends upon the condition of the organs or parts of the body

where morbid condition is its cause. Renal dropsy, besides general treatment, will require remedies calculated to relieve the renal disease, and a similar remark applies to hepatic dropsy. The general treatment for all forms of dropsy includes sometimes the removal of the watery fluid from the serous cavities, and also from the cellular tissue. This is sometimes accomplished by tapping, or *paracentesis*, when the liquid is drawn from a cavity; when from the abdomen, *paracentesis abdominalis*; when from the chest, *P. thoracis*; when from the head, *P. capitis*. The withdrawal of the liquid from the cellular tissue is performed by making numerous small punctures. The therapeutical remedies consist of diaphoretics, diuretics, and cathartics; and although they are often employed with more or less benefit, and sometimes assist in recovery, they frequently fail to give the hoped-for relief. Cathartics, especially those which belong to the class called *hydrogogue*, often reduce the amount of liquid considerably; but it generally returns, especially in incurable cases, and the patient is made weaker by the operation; and similar objections hold with regard to diuretics; they often relieve for a time, but are perhaps quite as often unsatisfactory. Both remedies in unfavorable cases may be called necessary evils. Diaphoretics may be given with more freedom, although the objection that they promote debility to a certain extent applies to them also. The use of jaborandi, or its alkaloid, which has been recently introduced into practice in this country, is perhaps attended with more benefit than that of any other diaphoretic. (See JABORANDI.)

DROSOMETER, an instrument for measuring dew. It is a simple balance in even poise, on one scale of which the dew falls, while the other is protected. The weights on the dry scale indicate the amount of dew on the wet scale.

DROUET D'ERLON, JEAN BAPTISTE, 1765-1844; Count, and marshal of France, governor of Algeria. He was an eminent soldier, serving at the siege of Valenciennes, Quesnoy, and Condé, in the blockade of Ehrenbreitstein, at Zurich, Schaffhausen, and Constance. As general of division he was distinguished at Ulm and Hohenlinden. He was wounded at Friedland, made an officer of the legion of honor, and a peer. He served in the peninsular war. In 1834, he was appointed governor of Algeria, and in 1843 was made a marshal.

DROYSEN, JOHANN GUSTAV, b. 1808; a German historian, studied at Stettin and Berlin, teacher in a gymnasium in the latter city, and private tutor in the university. In 1840, he became professor of history at Kiel, and was prominent in politics during the struggle between Denmark and the duchies, being the author of the *Kiel Address*, and one of the nine protesting professors of the university. He was a representative from Kiel in the diet of Frankfort, and subsequently a member of the Frankfort parliament. In 1851, he was professor of history at Jena, and in 1869, filled the same position in Berlin. He made a number of translations from the Greek, and has written several books on modern history.

DROZ, FRANÇOIS-XAVIER JOSEPH, 1773-1850; a French writer on morals and politics, who studied law in Paris. In 1799, he published an essay on the art of oratory; some years later, the romance of *Lina*, other essays, works on moral philosophy, on the science of life, and on the application of morals and philosophy to politics and political economy; also on Christianity, and an elaborate history of the reign of Louis XVI. He was a member of the academy.

DRUIDS, ORDERS OF, various social and benevolent organizations on the masonic plan, widely distributed in England, Australia, and the United States. The first order was formed in London, 1781; the first lodge in New York was organized 1833. In this country, 5 degrees have been added to the entrance degree; degrees have been instituted in England also. There are probably 125,000 members in all the world, of which more than 50,000 are in England, and perhaps 20,000 in the United States. In this country there were, 1870, about 150 "groves," of which number about two thirds were mainly of German membership.

DRUM-FISH, *Pogonias chromis*, of the family SCIENIDÆ, a fish allied to the *sheep's-head*, and inhabiting the shores of the United States, from New York to Florida, in schools. They vary from 2 to 4 ft. in length, and 15 to 18 in. in breadth, weighing from 10 to 25 lbs. Sometimes they are larger, weighing as much as 80 lbs. Scales large, stout, oblique; teeth on the jaws in a band. Pharyngeals with large paved teeth. Tongue broad, short, smooth; branchial rays, seven; dorsal fin has 10 stout, flattened rays, capable of being concealed in a furrow. Second dorsal fin rises at the termination of the first; pectoral fins large and pointed; air-bladder large and thick coated; spleen very long; stomach thick and muscular, with strong muscular columns; vertebrae, 24; color, bronze to red, rather lighter beneath, with a blackish spot behind the pectoral. There are two varieties according to De Kay, one dark brown, the *black drum* of the fishermen, the other the *red drum*. They are coarse food, but the young are regarded as a delicacy. The fish of this genus are remarkable on account of the noise which they make under water, which resembles that of a distant drum, and there is a difference of opinion as to the cause. Cuvier thought it had some connection with the air-bladder; De Kay attributes it to the compressing together of the broad pharyngeal teeth, and so do most of the fishermen, but they also believe that the trituration of the

shell-fish upon which they feed is the more immediate cause of the sound. They often afford good sport in the catching; the line is baited with soft clams or muscles, the shell being left on.

There is another species of drum-fish described and figured by De Kay, the *pogonias fasciatus*, much smaller, from 7 to 10 in. long, having four or five blackish vertical bands extending down the sides; the pectoral fins are a faint yellow, the others dark brown. This has been supposed to be the young of the *P. chromis*, but De Kay has seen them 6 in. long in Sept., having all the characteristics of the adult fish. Its teeth and jaws, as well as stomach, resemble those of the larger fish. It has various names, as *young drum*, *grunter*, and *young sheep's-head*.

DRUMMOND, a co. in the province of Quebec, Canada, intersected by St. Francis river; 600 sq.m.; pop. '71, 14,281.

DRUMMOND, Sir WILLIAM, 1760-1828; an English diplomatist, author of a *Review of the Government of Sparta and Athens; Origines, or Remarks on the Origin of Several Empires, States, and Cities*, etc. In 1796 and 1801, he was a member of parliament, and was made diplomatic representative in Naples and Constantinople. In *The Edipus Judaicus* he undertook to explain some of the Old Testament narratives as being astronomical allegories, for which he was very sharply censured.

DRUPA'CEÆ, a species of plants, placed by many as a sub-order of *rosaceæ*, having a one-celled, one-seeded indehiscent fruit, consisting of a fleshy, succulent exterior, and hard stone in center containing seed, such as the peach, plum, and cherry.

DRUSIUS, or VAN DEN DRIESCHE, JOHANNES, 1550-1616; a native of Flanders, an orientalist, and Protestant divine. He went to England when young, and became professor of oriental languages at Oxford. In 1576, he returned to his own country, and was given the same professorship in Leyden. He was subsequently professor of Hebrew in the university of Franeker, in Friesland. He had a son John who mastered Hebrew before he was nine years old.

DRUSUS CÆSAR, usually called Drusus junior, d. 23 A.D.; and son of Tiberius by his first wife. He was made quaestor in 10 A.D., consul in 15 A.D., but degraded the office by his excesses, and his father sent him with the army to Illyria. In 22 A.D., he was made *tribunicia potestas*, and looked upon as heir to the throne. Deeming Sejanus to be his rival, Drusus struck him in the face; whereupon Sejanus persuaded Livia, the wife of Drusus, whose affections Sejanus had beguiled, to poison him. The death of Drusus was charged to intemperance, but eight years afterwards the crime was confessed.

DRY PILE, a voltaic battery without liquids, supplying a feeble electric current. A usual form is with disks of copper and zinc papers in pairs, back to back, and packed in glass tubes—all the copper surfaces in one direction.

DRY TORTUGAS, the extreme south-western islets of the Florida Keys in the gulf of Mexico; 120 m. w.s.w. of the s. extremity of the mainland. They are of coral formation, low, and generally barren, though some are covered with mangrove bushes. Fort Jefferson, on one of them, was a penal station during the war of the rebellion. On the same island is a lighthouse. Pop. '70, 237.

DU'ALIN, an explosive preparation of nitro-glycerine and sawdust, intended to diminish the danger in the transportation and storage of nitro-glycerine.

DUANE, JAMES, 1733-97; b. N. Y.; a lawyer and a leader in the revolutionary war. He was a member of congress, 1774-77 and 1780-82; was the first mayor of New York after the revolution, and late in life was U. S. district judge.

DUANE, WILLIAM, 1760-1835; b. N. Y.; politician and journalist. He began journalism in India about 1784, but was sent back to England because of criticisms on the government, and his large fortune was confiscated. In London, he was for a time editor of the *General Advertiser*. In 1795, he came to Philadelphia and took the editorial chair of *The Aurora*, the organ of the Jeffersonian democracy, making it one of the most vigorously abusive journals in an abusive age. On one occasion he was mobbed and savagely beaten by a party of federalists. In 1822, he left the editorial chair and traveled in South America, and on return published an account of his wanderings. He served in the war of 1812. He wrote several works on military subjects.

DUBOIS', a co. in s.w. Indiana, bounded on the n. by White river, and having railroad connection with the Ohio; 420 sq.m.; pop. '70, 12,597. It has a varied surface, with much forest land; good soil, and abundant coal. Chief productions, wheat, corn, and tobacco. Co. seat, Jasper.

DUBOIS, ANTOINE, Baron, 1756-1837; a French surgeon; in 1790, professor in the royal college of surgery; one of the savants selected by Bonaparte to accompany the expedition to Egypt. It is said that at the accouchement of the empress (Marie Louise) his skill saved the lives of both mother and child. He was surgeon-in-chief of the hospital still known by his name. His publications were few, but he devised many new processes, and invented several new instruments.

DUBOIS, JEAN ANTOINE, 1765-1848; a French missionary in the East Indies, where he passed 32 years; author of *Letters on the State of Christianity in India*. He also contributed to the *Bulletin des Sciences*, and the journals of the Asiatic societies. His best known work was *Description of the Character, Manners, and Customs of the People of India, and of their Institutions, religious and civil*, which was published in English by the East India company, and subsequently in French at Paris.

DU BOIS-REYMOND, EMIL HEINRICH, b. 1818; a German scientist; member and perpetual secretary of the imperial academy at Berlin, imperial privy councilor, professor of physiology in the university of Berlin, and director of the physiological apparatus and of the physiological laboratory. He has made many important researches in animal electricity, and published invaluable works on that theme, and on recent progress in anatomy and physiology.

DUBOSSARI, or NOVIE DUBOSSARI, a t. in the government of Kherson, European Russia, on the Dniester, 101 m. above Odessa; pop. about 8,000. It is in a picturesque situation, surrounded with fertile fields and gardens, and has a number of important public institutions. Trade is chiefly in wine, tobacco, cattle, and grain.

DUBS, JAKOB, b. 1822; a Swiss politician; studied law at Heidelberg, Bern, and Zurich; in 1847, he was elected to the grand council; afterwards to other offices in his native canton. In 1857, he was president of the federal court; and, 1864 and 1870, president of the confederation. In politics he is a liberal, and has promoted many reforms. He is the author of a number of political works.

DUBUFE, ÉDOUARD, b. Paris, 1818; studied under his father, Claude Marie, and Paul Delaroche. He successfully followed his father's sentimental style, but afterwards painted Scriptural subjects. His later work has been chiefly in portraits, among them the empress Eugenie, Rosa Bonheur, and the members of the congress of Paris. Three of his large compositions have been exhibited in the United States—"The Prodigal Son," "The Conscript's Departure," and "The Soldier's Return."

DUBUQUE, a co. in e. Iowa, on the Mississippi river, watered by branches of the Maquoketa, crossed by the Dubuque and Pacific railroad; 625 sq.m.; pop. '75, 43,845. It is hilly and well timbered, with fertile soil, producing wheat, corn, butter, etc. There is abundance of lead ore, and more than 100 mines are in operation. Co. seat, Dubuque.

DUBUQUE (*ante.*), a city in Dubuque co., Iowa, picturesquely situated on a low terrace and on high bluffs on the w. bank of the Mississippi river, 155 m. w. of Chicago; pop. '75, 23,605. It is the center of an important railroad system; and the river is here crossed by an iron railway bridge to Dunleith, Ill. Dubuque is a port of entry, and has a collector and a custom-house, and is the most important center of trade in the lead region. Its annual export of lead, taken from the mines near the city, is from 10,000,000 to 20,000,000 lbs. The river commerce in produce and manufactures is also large, the country around being an excellent agricultural region. There are several fine churches. The Roman Catholics and the Episcopalians have bishops in the city. Of educational institutions there are St. Joseph's college and academy, and St. Mary's academy, both Roman Catholic, and several schools under control of the same denomination. Besides these there are the Iowa institute of science and art, a German Presbyterian divinity school, and manufactories for farming tools, engines, machinery, leather, bricks, lead, flour, soap, etc. The place was named from Julien Dubuque, a French Canadian, who settled on the spot in 1778, with permission from the Spanish government to carry on mining. The permanent settlement was in 1833; town incorporated 1837; chartered as a city 1840.

DUCAS, MICHAEL, lived about the middle of the 15th c.; a Greek historian, of a family that gave several emperors to Constantinople. After the fall of that city he was employed in diplomatic business. He wrote a history beginning at the death of John Palæologus and extending to the capture of Lesbos in 1462, which is a valuable source of information concerning the close of the Greek empire.

DU CHAILLU, PAUL BELLOXI, b. Paris, 1835; son of a trader to the w. coast of Africa, where the boy passed some time at an early age, and acquired knowledge of the language and modes of life of the neighboring tribes, and of natural history. In 1852, he traveled through the United States, and published a series of papers on the Gaboon country. In Oct., 1855, he left New York to explore equatorial Africa, and spent nearly four years in the work, reaching to about 14° 15' east. During this trip he shot and stuffed more than 2,000 birds, of which 60 were species before unknown. He also killed more than 1000 animals, among them several gorillas, a species probably never before seen by Europeans. In 1859, he returned to the United States with his natural history specimens and a great collection of arms and domestic implements. He published an account of his trip in *Explorations and Adventures in Equatorial Africa*. He was one of the first to describe the gorilla; and the truth of his narrative was strongly attacked, and as stoutly defended, mainly by English savants. This provoked the traveler to undertake a second journey, and he sailed from England for that purpose in Aug., 1863. He went over much of his course on his first trip, but explored some new regions. In Sept., 1865, he was compelled to return to the coast in consequence of the hostility of the natives, having lost everything except his journals. This venture was

detailed in *A Journey to Ashango Land*. He lectured in the United States, where he fixed his residence, and in 1872-73, made a trip in Norway, Lapland, Sweden, and Finland. Besides the works named he has published *The Gorilla Country; Wild Life; Lost in the Jungle; My Apingi Kingdom; and the Country of the Dwarfs*.

DU CHÂTELET. See CHÂTELET LOMONT, *ante*.

DUCHÉ, JACOB, D.D., 1739-98; b. Philadelphia; graduate of the college of that city in 1757, completing his education at Cambridge, Eng. In 1775, he was rector of Christ church in Philadelphia. The next year he was chaplain to the first continental congress, and gave all his salary for the relief of the families of soldiers killed in the war. His courage gave out on the capture of Philadelphia by the British, 1777, and he wrote to Washington urging him to cease what seemed to be a hopeless struggle. The letter was laid before congress, and Duché fled to England, and his property was confiscated. He returned in 1790, but could not regain position or influence.

DUCLOS, CHARLES PINEAU, 1704-72; a native of Brittany; writer of romance and history. Among his works were *Acajou and Zirphile; The Baroness de Luz; and Confessions of the Count de XXX*, all romances; *History of Louis XI.; Secret Memoirs of the Reigns of Louis XIV. and XV.; Considerations on Italy*, etc. Though living in Paris he was elected mayor of Dinant, and was chosen deputy to the assembly of the states of Brittany. At the request of that body he was granted a patent of nobility.

DUCORNET, LOUIS CÉSAR JOSEPH, 1806-56; a French artist. He was born without arms, and learned to use his feet for hands. Having a talent for painting, he made such excellent drawings with his toes that at the age of 13 he was taken into the academy as a pupil. When but 16 he took the first prize for drawings of the human form, and both the national government and his native city settled pensions upon him. Not only was he without arms, but he had only four toes on each foot, and his lower limbs were far from perfect. In conversation, he gesticulated with his legs. He was expert in painting, and among his best efforts were "Parting of Hector and Andromache," and "Edith Finding the Body of Harold."

DUCROT, AUGUSTE ALEXANDRE, b. 1817; a French general, educated at St. Cyr; served in Algeria and Africa, and in 1869 in command of the 6th division quartered at Strasburg. He fought at Sedan, and when MacMahon was wounded, took the chief command. After surrender he refused to accept conditions, escaping to Paris, and took command of the 13th and 14th army corps. He participated in the last disastrous sortie, Jan. 19, 1871. After the fall of Paris he was elected to the national assembly. He published *The Truth about Algeria; The Day of Sedan;* and some other works.

DUDLEY, BENJAMIN WINSLOW, LL.D., 1785-1870; b. Va.; a surgeon, educated in Transylvania and Pennsylvania universities; studied in Europe, and settled in Lexington, Ky. His specialty was lithotomy, or removing stone from the bladder, of which his recorded operations numbered 225, with 6 deaths. He also successfully used ligatures on the carotid artery for aneurism in the skull. He was professor of surgery in the medical school of Transylvania university, which he organized, and which was long the leading medical school in the west; and author of a number of valuable papers.

DUDLEY, CHARLES EDWARD, 1780-1841; a native of England; came to America in 1794; in 1809, married into the Bleecker family of New York, and settled in Albany. He was successively state senator, mayor of the city, and U. S. senator to fill the unexpired term of Martin Van Buren, whom Jackson had sent as minister to England. He was greatly interested in astronomical science, and after his death his widow gave \$70,000 for the erection of the observatory at Albany, which bears his name.

DUDLEY, JOSEPH, 1647-1720; b. Mass.; son of Thomas, and also governor of the colony. He studied theology, but went into political life, and from 1677 to 1681, was one of the commissioners of the united colonies. He was at the battle with the Narragansetts in 1675, and one of the commissioners to make peace with that tribe. James II. made him president of New England in 1685; two years later, he was appointed chief-justice, and was arrested as one of the friends of Andros, with whom he was sent to England. In 1690, he was made chief-justice of New York. In 1693, he went to England, and in 1701, was elected to parliament. From 1702 to 1715, he was governor of Massachusetts colony. It is recorded that he was a philosopher, a scholar, a divine, and a lawyer, all combined.

DUDLEY, PAUL, 1675-1751; son of Joseph; graduate of Harvard; studied law in London; was commissioned attorney-general of Massachusetts in 1702, promoted to the bench in 1718, and made chief-justice in 1745. He was a member of the legislature, a learned naturalist, and a member of the royal society. He left a legacy to Harvard to establish a yearly lecture in defense of Christianity; and published a number of works, among them one against the church of Rome.

DUDLEY, THOMAS, 1576-1652; a native of England, who came to Massachusetts in 1630 as deputy-governor, and was governor from 1634 to 1640, and again from 1645 to 1650. He had been an officer of the British force in Holland, and retrieved the fortunes of the earl of Lincoln by judicious management of his estates. He was a bold and

somewhat intolerant man, but an efficient officer. He died at Roxbury, leaving a large estate. Simon Bradstreet was his son-in-law.

DUEL (*ante*). In the southern portion of the United States the custom of dueling, though of late years falling into disuse, is a recognized institution of society. Half a century ago the pistol and the bowie-knife were as much a part of a man's equipage as his hat or his boots. A gentleman of good social position who had not fought at least one duel was often looked upon as deficient in the qualities proper to his station. Sudden affrays in the streets, stealthy assassinations, and bitter family feuds, were the consequences. These feuds rived in duration and ferocity the Venetian vendetta. The land was full of swaggering bullies who had, metaphorically, in one hand a pack of cards and in the other a pistol. Modern civilization, and more especially the war of the rebellion, in which the southern states suffered so terribly, have greatly modified this fire-eating spirit. Other influences have assisted. Not only is the general voice against the practice, but in a large number of the states laws have been enacted which pronounce the killing of a fellow-being in a duel to be murder, and in still more states the mere sending of a challenge is a felony. The first duel on record in America was fought June 18, 1621, in New England, between two servants who fought with sword and dagger, and both were wounded. They were sentenced to have their heads and feet tied together, and lie 24 hours without meat or drink. In 1728, one young man killed another on Boston common in a night duel with swords. The survivor escaped from the country, and a severe law against dueling was enacted. During the revolution there were a number of duels. Charles Lee and John Laurens fought, and the former was wounded; Gwinnett, a signer of the declaration of independence was killed by gen. McIntosh. Gen. Greene was twice challenged, but refused to fight, and Washington approved his refusal. The most notable duel in the country's history was when Alexander Hamilton was slain by Aaron Burr. On that occasion a great man was lost to the nation, and a dangerous demagogue was socially and politically ruined. In the navy the duel in which Decatur was killed and Barron wounded holds the first place. Andrew Jackson killed a man named Dickinson, and was engaged in several other conflicts. Col. Benton killed Lucas, and also had other duels. Henry Clay and John Randolph, the two most brilliant men at that period in congress, fought in 1826. Jonathan Cilley, a member of congress from Maine, was killed by William J. Graves, a member from Kentucky, in 1838. Although himself a duelist, Jackson, while president, expelled officers from the navy for dueling. At the present time a person in the military or naval service implicated in a duel, either as principal or second, may be summarily cashiered. In the northern states the appeal to arms is seldom heard of, though by no means uncommon at the beginning of the century. De Witt Clinton fought with and wounded John Swartwout in 1802, and the next year challenged gen. Dayton of New Jersey. One might suppose that journalism was a calling of any other than a warlike nature, but there have been several notable duels between editors. In 1804, James Cheetham, editor of the *American Citizen*, challenged William Coleman, editor of the *New York Evening Post*. The two did not fight, but there was a duel growing out of the challenge between Coleman and a harbor-master named Thompson, and the latter was supposed to have been killed. John D'Oley Burke, an Irishman, author of a drama called *Bunker Hill, or the Death of Warren*, and editor of a paper in New York, was killed in a duel in 1808. In 1846, Thomas Ritchie, jr., and John H. Pleasants, editors of the *Enquirer* and the *Whig* of Richmond, Va., met in a field, armed with swords and pistols, and had a desperate fight, in which Pleasants was killed, Ritchie being only slightly wounded. In 1842, James Watson Webb, editor of the *New York Courier and Enquirer*, fought with Thomas F. Marshall, a member of congress from Kentucky, and Webb was slightly wounded. The number of duels among editors in the southern states is very great. In some of the states the killing of a man in a duel is punishable with death; in others by imprisonment and forfeiture of political rights. In some states certain officers are required to swear that they have not been, within a certain period, and will not be, engaged in a duel.

DUENNA (feminine of "Don"), a woman in Spain, something more than a governess, and something less than an equal of the family, having charge of a gentleman's daughters, or being companion to the lady of the house.

DUER, JOHN, LL.D., 1783-1858; b. N. Y.; a distinguished jurist; son of William Duer, a revolutionary patriot whose wife was a daughter of William Alexander, claimant of the earldom of Stirling. Duer studied law, and from 1820 until his death was in practice in New York. In 1825, he was one of the commissioners to revise the laws of the state; in 1849, he was elected justice of the superior court, and in 1857, became chief-justice. He published *Duer's Reports*, works on marine insurance, and addresses before the New York historical society.

DUER, WILLIAM ALEXANDER, 1780-1858; b. New York; brother of John. Through his mother he was grandson of lord Stirling. He studied law, and about 1802 became a partner of Edward Livingston, in New Orleans. About 1812, he returned to New York, where from 1822 to 1829, he was a judge of the supreme court. In 1829, he was elected president of Columbia college. He published a *Treatise on the Constitutional Jurisprudence of the United States*.

DUFAURE, JULES ARMAND STANISLAS, b. Saujon, France, 1798; studied law in Paris, and in 1834 was chosen deputy from Saintes, and regularly re-elected until 1848. He was counselor of state in 1836, and minister of public works in 1839. In 1844, he was chosen vice-president of the chamber, and after the revolution of 1848, was minister of the interior. Louis Napoleon gave him the same office, but after the *coup d'état* he returned to private life. In 1871, he was made minister of justice and vice-president of the council of ministers, but these offices were taken away in 1873.

DU FAY, CHARLES FRANÇOIS DE CISTERNAY, 1698-1739; b. Paris. He made important researches concerning the barometer, the nature of phosphorus, the refracting power of crystals, electricity, and the magnet. He spent many years in rearranging and improving the garden of plants in Paris.

DUFFERIN, FREDERICK TEMPLE HAMILTON BLACKWOOD, Earl of, b. England, 1826; educated at Eton; succeeded his father in 1841 as fifth baron Dufferin and Clan- deboye. He was for some years lord-in-waiting on the queen. During the Irish famine of 1846-47, he traveled in that country, and wrote an account of the wretchedness. In 1855, he was attached to the Austrian mission. In 1859, he made a yacht voyage to Iceland, an account of which he published in *Letters from High Latitudes*. In 1860, he was sent as British commissioner to Syria to inquire into the massacre of Christians. In 1864, he was under-secretary of state for India, and in 1866, under secretary of war. Gladstone, in 1868, made him chancellor of the duchy of Lancaster; and in 1872, he was appointed gov. gen. of the dominion of Canada, where he had great popularity. In 1876, he made a tour through British Columbia. In 1878, he was superseded by the marquis of Lorne, and was immediately elected president of the royal geographical society. He was made an earl in 1871.

DU GUESCLIN, BERTRAND, 1314-80; constable of France, and the most famous French soldier of the age. He was so remarkable for ugliness, when a child, as to be an object of aversion to his parents. He gained his first reputation as a soldier in 1338 at a tournament to celebrate the marriage of Charles of Blois with Jeanne de Penthievre, at which he unseated all the famous competitors. Becoming a soldier of fortune under Charles, he gained great distinction at the siege of Vannes in 1342. He was knighted, and in 1351 went, with the lords of Brittany, to England to secure the release of his captive master. He gallantly relieved Rennes, besieged by the duke of Lancaster in 1356, and by his help the city held out till the truce of Bordeaux in June, 1357. He soon took service under the French king, and, after several brilliant actions, was made marshal of Normandy and count of Longueville. At the battle of Auray, in 1364, he was taken prisoner, but he was ransomed for 100,000 crowns; and becoming commander of the grand companies, led them into Spain, where he placed Henry of Trastamare on the throne of Castile in 1366. In the next year he was taken prisoner by the Black Prince, then in alliance with Pedro the cruel. Being again ransomed, he again restored Henry to the throne in 1369. In 1370, he was made constable of France, and for ten years was active and successful in driving the English from the s. and w. of France. In 1373, he seized and held the duchy of Brittany. He died while besieging the fortress of Châteauneuf-Randon. The garrison had already agreed to capitulate, and their commander led them out, and placed the keys of the castle upon the coffin of the constable.

DUHAMEL DU MONCEAU, HENRI LOUIS, 1700-82; a French botanist. For discovering the disease which was destroying the saffron plant (a parasitical fungus attacking the roots), he was made a member of the academy of sciences. Alone, and with Buffon, he made many experiments in vegetable and animal physiology, and the influence of the weather on agricultural production. Late in life he was appointed inspector-general of marine.

DUILLIAN COLUMN, erected in the forum at Rome in honor of the naval victory of C. Duillius. The name *rostrata* was given to columns commemorating naval victories (from *rostra* the beak of a ship), as they had on each side projections in the form of such beaks. Michael Angelo restored this column, and his restoration is in the Palazzo de' Conservatori, on the Capitoline hill. Its pedestal retains a portion of the original inscription.

DUJARDIN, FELIX, 1801-60; b. Tours, France; studied mathematics and geology, but was induced by Dutrochet to turn his attention to zoology. His specialty was *Infusoria*, concerning which he arrived at conclusions different from those of Ehrenberg. He was professor at Toulouse and at Rennes, and wrote a number of works on his favorite subjects.

DUKES, a co. of s.e. Massachusetts, consisting wholly of islands in the Atlantic ocean; in all, about 118 sq. m.; pop. '80, 4,305. Martha's Vineyard is the largest island, and is about 5 m. from the mainland. There is some agriculture, but the chief business is fishing and commerce. Co. seat, Edgartown.

DULCAMARA, the young branches of bitter-sweet or woody night-shade (*solanum dulcamara*), a perennial plant of the order solanacææ. The dried branches, sold by the druggists, contain an alkaloid, solanine, besides a sweet and bitter principle, dulcamarine or picroglycyon, and other matters. It is feebly narcotic, with power to increase the secretions, particularly of the kidneys and skin. It sometimes produces a

dark purple color of the face and hands, with languid circulation of the blood. Overdoses produce nausea, vomiting, faintness, vertigo, and convulsive muscular movements. It is used in skin diseases, particularly those of a scaly character, as lepra and psoriasis, when it is often combined with antimonials; and has been used in chronic rheumatism and catarrh, also in some forms of mania. It is usually given in the form of a decoction, but there is an officinal inspissated and a fluid extract.

DULCE, a gulf in Costa Rica, on the Pacific coast, 8° 3' n., 83° 53' west. It extends over about 800 sq. m. and is fed by a small river of the same name.

DULCE, a lake in e. Guatemala, near Honduras, about 30 m. by 12, and from 30 to 60 ft. in depth. Its waters empty into a smaller and shallower lake called the Golfete, and thence reach the sea through the Rio Dulce, a narrow strait running between high hills. A bar at the mouth of this strait prevents the entrance of vessels requiring more than 6 ft. of water.

DULONG, PIERRE LOUIS, 1785-1838; b. Rouen, France. His attention was given chiefly to natural sciences, and he made many valuable and some dangerous experiments in chemistry, losing a finger and an eye in his search for knowledge. He investigated the phenomena of animal heat, in company with Berzelius and Berthollet. With Arago he studied several years the elastic power of steam at different temperatures, trying to find preventives of steam-boiler explosions.

DULUTH, a city, the capital of St. Louis co., Minnesota, at the western extremity of lake Superior, 155 m. n.e. of St. Paul. It is the point of departure of the Northern Pacific railroad, and has connection through St. Paul with all the great railroad lines extending eastward and southward to every part of the United States. The harbor, formed by two points, one of them extending 7 m. into the lake, is well protected, and has been to some extent improved. A ship-canal, 250 ft. wide, cut across Minnesota point, gives ready access from the lake. The Northern Pacific railroad has built large and substantial docks for its own use, and there are besides several docks and piers constructed by the citizens for general traffic. The government has constructed a breakwater for the protection of the outer harbor. The city derives its name from capt. Jean Du Luth, a French officer and traveler who visited the region in 1679. No longer ago than 1869 the site was a wilderness; one year later it had a pop. of 3,131; pop. '75, 5,000. It has a dozen churches, a custom-house, a weather-signal office, a national bank, several newspapers, manufactories of stoves, carriages, and machinery, and is the center of a growing trade in wheat, flour, and other commodities.

DUMAS, MATTHIEU, Count, 1753-1837; a French soldier and military historian. He entered upon active service in the army in 1780 as aid to Rochambeau, commander of the French force sent to the aid of the Americans then in revolt against England. He was in a number of engagements, including the capture of Yorktown. After peace, he returned to France. In the revolution of 1789, he acted with Lafayette and the constitutional liberal party. In 1791, he was elected to the assembly, and the next year was chosen president of that body. During the reign of terror he absented himself from France, with some brief intervals. In 1797, he was proscribed as a monarchist, and fled to Holstein. When Bonaparte became first consul he was recalled, and appointed chief of staff to the army of Dijon. He was subsequently counselor of state, and grand officer of the legion of honor, whose organization he defended before the corps législatif. He went with Joseph Bonaparte to Naples, and was made minister of war. In 1808-9, he served in the French army in Spain and Germany, and after the battle of Wagram he was employed in negotiating the armistice. He was intendant-general of the army in the Russian campaign, an office which involved the charge of the entire administrative department. He shared the horrors of the retreat from Moscow, took part in the battles of Lutzen and Brantzen, and after the defeat at Leipsic was employed to negotiate the capitulation; but his terms were not accepted by the allied powers, and he was arrested and imprisoned until the conclusion of peace in 1814. He was in favor under the temporary restoration, and held important commissions. When Napoleon returned from Elba, Dumas was intrusted with the organizing of the national guards. This put him out of favor with the Bourbons, and when Louis XVIII. was finally restored, he was obliged to retire on half-pay. He then finished his review of military events, in 19 vols., embracing the history of the war from 1798 to 1807. In 1818, he was restored to favor, and made a member of the council of state; in 1828, he was a deputy in the assembly from Paris. After the events of 1830, he was made a peer, and re-entered the council of state as president of the war committee.

DUMB AGUE, a common name, although not unscientific, of masked ague, or a form of intermittent fever, in which the prominent symptoms, as the shaking chill, and the succeeding violent fever, are not present, or the tendency to them only slightly indicated. It is sometimes applied, though erroneously, to a much more serious and dangerous form, called pernicious, malignant, or congestive intermittent fever. See INTERMITTENT FEVER.

DÜMICHEM, JOHANNES, b. Silesia, 1833; studied at Berlin, and turned his attention to Egyptian archeology. He made several trips to that country, and made

some remarkable discoveries concerning the temple of Denderah. He has written nearly a dozen works on Egyptian and other archaeology.

DUMMER, JEREMIAH, 1680-1739; b. Boston; graduated at Harvard; studied theology and spent some years in the university of Utrecht. He was in England as one of the agents of Massachusetts, and became familiar with Bolingbroke, some of whose views, it is thought, he adopted. He published a *Defense of the New England Charters*, and some less important works. His brother, WILLIAM, 1677-1761, lieutenant governor, founded the Dummer academy at Newbury, Mass.

DUMONT D'URVILLE, JULES SÉBASTIEN CÉSAR, 1790-1842; native of Normandy; a French navigator. He was self-taught, mastering botany, entomology, and a number of modern and ancient languages. In 1820, while on a surveying trip in the Mediterranean, he was so fortunate as to recognize in a Grecian statue just unearthed the Venus of Milo, and to secure its preservation. In later years, he was concerned in explorations around the Australian continent, New Zealand, Van Dieman's Land, and other Pacific and Indian islands. In 1830, he transported the exiled Charles X. to England. His next and most important venture was in antarctic exploration. He sailed in Sept., 1837, with two vessels. In Jan., 1838, they reached the antarctic ice, along which they coasted to the e. for 300 miles. Turning w., they visited the South Orkneys, the New Shetlands, and discovered Joinville land and Louis Philippe's land; but sickness compelled them to run to Chili. Thence they crossed the Pacific, visiting the Fiji and Pelew islands, New Guinea, and Borneo. In 1840, they returned to the antarctic region, and discovered Adélie land. In Nov., he arrived at Toulon. D'Urville was at once appointed rear-admiral. In 1842, he was killed, with his wife and son, in a railway accident. His works on natural history, and especially his collections, are valuable.

DUMPY LEVEL, a leveling instrument for short distances. It has a short telescope with large field, and the compass is fixed underneath.

DUNCKER, MAXIMILIAN WOLFGANG, b. Berlin, 1811; graduate and professor at Halle. He was a member of the Frankfort parliament, and of the Prussian diet. In 1861, he was counselor to the crown prince, and in 1867, director of the Prussian archives. His chief work is a *History of Antiquity*.

DUNDAS, a co. in Ontario on the St. Lawrence, intersected by the Grand Trunk railroad; pop. '71, 18,777.

DUNFISH, codfish cured so that they have a dark or dun color. They are split and partially salted, piled away in a dark place, covered with eel-grass, and pressed. The process gives them a peculiar flavor.

DUNGLISON, ROBLEY, LL.D., 1798-1869; b. England, educated in Germany, and called to the chair of medicine in the university of Virginia; afterwards professor in the university of Maryland, and in the Philadelphia medical college. He was a diligent student, and enjoyed a high reputation for benevolence. He was the author of a large number of excellent medical books, among which are a *Medical Dictionary* and *Therapeutics and Materia Medica*. The dictionary is a standard work of its class.

DUNKERS, or TUNKERS. See BAPTISTS, GERMAN.

DUNKIRK, a village on lake Erie, in Chautauqua co., N. Y., reached by the Lake Shore and Michigan Southern railroad; 40 m. w. of Buffalo. It is at the w. end of the New York and Erie railroad; pop. of township, '75, 7,665. Dunkirk is a port of entry, with a good harbor, and has a large lake trade by steam and sailing vessels. In the town are an opera house, a dozen or more churches, an orphan asylum, a monastery, a public hall, the extensive repair-shops of the Erie railroad, locomotive works, iron works, and other factories. There is a horse railroad to the village of Fredonia.

DUNKLIN, a co. in s.e. Missouri, on the Arkansas border; 700 sq.m.; pop. '70, 5,982-166 colored. The surface is mostly prairie and swamp, with moderate fertility. Agriculture is the chief business. Co. seat, Kennet.

DUNLAP, WILLIAM, 1766-1839; b. N. J.; a painter and author. His early life was devoted to painting, interspersed with literary and theatrical work. He wrote a number of plays, and published a *History of the American Theater*; *Arts of Design in the United States*; and a *History of the New Netherlands*. He was one of the founders of the New York academy of design.

DUNMORE, a borough in Pennsylvania, Luzerne co., near Scranton; pop. '70, 4,311. Coal mining is the chief business.

DUNN, a co. in n.w. Wisconsin on Chippewa and Red Cedar rivers; 864 sq.m.; pop. '70, 9,488. Productions, grain, hay, butter, etc. Co. seat, Menomonie.

DUNNING, JOHN, Lord ASHBURTON, 1731-83; an English lawyer. His fame began in 1762 with his *Defense of the United Company of Merchants of England trading to the East Indies, and their Servants, particularly those at Bengal, against the Complaints of the Dutch East India Company to his Majesty on the Subject*. In 1763, he further distinguished himself in the defense of John Wilkes, whose cause he conducted throughout. In 1766, he was chosen recorder of Bristol, and the next year was appointed solicitor-general.

After 1771, he was in the opposition, making many powerful speeches in parliament. In 1782, he was appointed chancellor of the duchy of Lancaster, and about the same time was raised to the peerage.

DUNSTER, HENRY, d. 1659; b. England; educated at Magdalen college, Cambridge; came to Massachusetts, 1640, and in the same year became the first president of Harvard college. He was esteemed for piety and learning; but was compelled to resign his office, 1654, for having publicly opposed infant baptism.

DUNTON, JOHN, 1659-1733; b. in England, and apprenticed to a bookseller. In 1736, he migrated to New England to sell books. He conducted *The Athenian Mercury*, of which 20 vols. appeared. He was a prolific writer on religion, morals, and politics.

DU PAGE, a co. in n.e. Illinois, traversed by four or five railroads; 340 sq. m.; pop. '70, 16,685. The soil is very fertile, producing grain and fruit in abundance. Co. seat, Wheaton.

DUPANLOUP, FÉLIX ANTOINE PHILIBERT, b. Savoy, 1802; d. Paris, 1878. In 1825, he was ordained a priest; in 1827, was confessor to the young duke of Bordeaux; next year catechist to the Orleans princes; and in 1830, chaplain to the daughter of Louis XVI. In 1849, he became bishop of Orleans, where he first gave full scope to his plan for Christian education. In 1848, he was instrumental in having the first French expeditionary corps sent to the papal states. He was often in conflict with the censor of public worship in France. He opposed papal infallibility, but was prompt to accept the dogma when it had been promulgated. At the close of the war with Germany he was sent as a representative to the national assembly, where he favored a constitutional monarchy, the restoration of the Bourbons, and a complete system of education. He published a number of works on religious subjects.

DUPERREY, LOUIS ISIDORE, 1786-1865; a French navigator and scientist, native of Paris. He served under Freycinet in the voyage around the world (1817-20), in charge of the hydrographic operations. In 1822-25, he was in command of a vessel, making scientific explorations in the Pacific and along the coasts of South America. The later portion of his life was devoted to investigations in terrestrial magnetism. He was a member of the French academy of sciences.

DUPERRON, JACQUES DAVY, 1556-1618; a French cardinal. He was brought up a Protestant, but at the age of 20 abjured, and was appointed reader to king Henry III. He became noted as a pulpit orator, and rose to fame and fortune. Soon after Henry IV. came to the throne, Duperron converted him to the Roman Catholic faith, and after the taking of Paris, went to Rome to induce the pope to remove the interdict laid upon the kingdom. In 1604, he was sent to Rome as chargé d'affaires, and within a month was active in the election of two popes—Leo XI. (who reigned 24 days), and Paul V. While at Rome he was made archbishop of Sens, and soon afterwards a cardinal. Duperron was a zealous advocate of papal prerogative, and a man of great ability and untiring energy.

DU PETIT-THOUARS, ABEL AUBERT, 1793-1864; a French naval officer. From 1837 to 1841, he was circumnavigating the globe; rose afterward to be rear-admiral and commanded the Pacific fleet. In 1842, he placed the island of Tahiti under the protection of France, and the same year extended the protectorate over the Marquesas islands. In 1843, when the English missionaries and the natives of Tahiti rose against French rule, he placed the whole Society group under French domination. At the demand of the English government he was recalled. In 1846, he was made vice-admiral, and in 1849, was elected to the legislative assembly. He wrote *A Voyage Around the World*.

DUPLEIX, JOSEPH FRANÇOIS, 1697-1764; Governor-General of the French establishments in India. He made several voyages to America and India, and displayed remarkable business aptitude. While governor in India his ambition was to extend French possessions, and he was frequently in diplomatic contest and in armed conflict with the English, at the same time endeavoring to win over the native princes. All this was theoretically stopped by the peace of Aix-la-Chapelle; still Dupleix continued his efforts, entering into negotiations for the subjugation of Southern India, and sending troops to the aid of two claimants of the sovereignty of the Carnatic and Deccan, while the English were engaged on the side of their rivals. His scheme failed, but the trouble continued until 1754, when Dupleix was recalled to France. He died in obscurity and want.

DUPLIN, a co. in s.e. North Carolina, watered by a branch of Cape Fear river, and intersected by the Wilmington and Weldon railroad; 670 sq. m.; pop. '70, 15,542—6,766 colored. The surface is level, and the soil sandy, with some fertile tracts. Productions—corn, rice, cotton, etc. Co. seat, Kenansville.

DUPONCEAU, PETER STEPHEN, LL.D., b. France, 1760, d. Philadelphia, 1844. He was bred to the law, and became secretary to baron Steuben, and with that soldier came to aid the Americans in the revolution. He was with Steuben through the war, and at its close took up his residence in Philadelphia, where, in 1785, he was admitted to the bar. He was offered, but declined, the chief-justiceship of Louisiana. He paid much attention to philology; and in 1819, as chairman of the committee on history,

moral science, and general literature of the American philosophical society, he made a report on the structure of the Indian languages. In 1835, the French institute sent him the Volney prize for a similar work. In 1838, he published an essay on the Chinese system of writing. He also wrote on the cultivation of silk, and made efforts to establish its culture in the United States. He wrote on many other subjects, and his contributions to American history were valuable.

DUPONT, PIERRE, 1821-71; b. at Lyons, the son of a workman of Provins. He was brought up by his cousin, who was priest of Roche Taillée-sur-Saône, and, after leaving the seminary of Largentières, passed a short time in a lawyer's office. In 1839, he found his way to Paris, where he succeeded in having some of his poems published in the *Gazette de France* and the *Quotidienne*. His first volume of poems, *Les Deux Anges*, appeared in 1841; and in 1847, he made a great hit by his peasant song, *J'ai deux grands bœufs dans mon étable*, which induced him to devote himself to lyrical poetry. Many of his songs, accompanied by airs of his own invention, became very popular. Among the best known are *Le brâconnier*; *Le tisserand*; *La Vache blanche*; and *La chanson du blé*.

DU PONT, SAMUEL FRANCIS, 1803-65; b. N. J.; midshipman in the navy, 1815; lieutenant, 1826; commander, 1843. In 1845, he commanded commodore Stockton's flagship in the Pacific squadron, and, during the war with Mexico, did service on the California coast, taking a leading part in the capture of Mazatlan. In 1856, he was made capt., and was sent on special duty to China. When the rebellion began, he was in command of the Philadelphia navy-yard. In Sept., 1861, he was appointed flag officer, and given command of the South Atlantic blockading squadron. In Nov., he captured the forts at Hilton Head and Bay Point, the defenses of Port Royal harbor. In 1862, he was made rear-admiral. In April, 1863, he made an unsuccessful attack on Fort Sumter. In the following year, he was retired from active command.

DUPONT DE L'ÉTANG, PIERRE, Count, 1765-1838; a French officer, appointed brigadier in 1793, and gen. of division in 1797. He was with Napoleon at the overthrow of the directory; fought at Marengo; defeated a superior Austrian force at Pozzolo; won further laurels in the Austrian and Prussian campaigns, and, by a singularly bold movement, decided the victory of Friedland. In 1808, he commanded in Spain, where he was compelled to surrender his whole army. For this, he was degraded and imprisoned. On the fall of the emperor, he was restored to liberty and made minister of war, but was soon dismissed. After the second restoration, he became a member of the privy council. He was several times elected to the chamber of deputies.

DUPONT DE NEMOURS, PIERRE SAMUEL, 1739-1817; a French statesman and economist, a prolific writer on questions of finance. In 1772, he was secretary of the council of public instruction of Poland. He came back two years afterwards to assist his friend Turgot in the French administration. With Turgot he went into retirement, where he wrote the memoirs of his friend, and translated Ariosto. In 1782, he was employed in constructing the treaty by which the independence of the United States was recognized. Subsequently he was a member of the council of state, and was appointed commissary-gen. of commerce. During the revolution he favored a constitutional monarchy, but was compelled to flee when the republicans triumphed. During his concealment he wrote his *Philosophy of the Universe*. He was found and imprisoned; but as Robespierre's head fell first, Dupont's was saved. He was one of the council of five hundred, and a thorough reactionist. In 1797, his house was sacked by a mob, and he narrowly escaped transportation. Finding France uncomfortable, in 1799 he and his family emigrated to the United States. In 1802, he returned, but declined to receive any political office, except that he was one of the commissioners to arrange the transfer of Louisiana to the United States. Jefferson, whose love of French democratic institutions was only equalled by his hatred of anything English, requested Dupont to prepare a scheme of national education, which was published in French in 1812. The scheme was never adopted in the United States, but some of its features were embodied in the French code. After Napoleon's first downfall, Dupont became secretary to the provisional government, and on the restoration of the Bourbons, he was made a counselor of state. The return of Napoleon caused him to leave France, and he spent the remainder of his life with his two sons, powder manufacturers, in the state of Delaware.

DUQUOIN, a city in Perry co., Ill., at the junction of the Illinois Central and the St. Louis and Southern Illinois railroads; 77 m. n. of Cairo; pop. '70, 2,212. It is in a rich coal region, and has a large trade in shipping tobacco, wool, etc.

DURAN, AUGUSTIN, 1789-1862; a Spanish poet, educated to the law in the university of Seville, and admitted as an advocate. In 1834, he was secretary of the board for the censorship of the press, and soon afterwards had a place in the national library, of which he became a director. He published a discourse on the influence which modern criticism had exercised on the ancient Spanish theater, a number of volumes of old romances, and a collection of old Spanish comedies. He is best known by his poem *The Three Citron Trees of the Orchard of Love*.

DURAND, ASHER BROWN, 1796-1874; b. N. J. He was at first a watchmaker, but in 1812 was apprenticed to an engraver in New York, becoming a partner in the busi-

ness at the expiration of his time of service. His large engraving of Trumbull's *Declaration of Independence*, which cost him three years of work, brought him into notice, and thenceforward his path was one of success. In 1835, he quitted engraving and turned his entire attention to painting, at first portraits only, but later of natural scenery, in which he was ranked among the first of artists. He was for several years president of the New York national academy of design. He translated several works on art.

DURANGO, a state in n. Mexico, s. of Chihuahua, and w. of Coahuila; 42,498 sq. m.; pop. 190,846. The w. part is mountainous, but the e. is level and fertile. In the n.w. is a large and desolate area inhabited only by Indians. The climate is cold on the mountains, but generally temperate on the plains. Sugar cane, tropical plants and fruits, cotton, flax, wheat, and other cereals are grown. There are many rich gold mines; some deposits of silver; and copper and lead are abundant. The chief town is the city of the same name.

DURANGO, sometimes called CIUDAD DE VICTORIA, or GUADIANA, a city of Mexico, capital of the state of Durango, near the foot of the s. slope of the Sierra Madre, 7,295 ft. above the sea-level; pop. 12,449. The city was founded in 1559 by Alozo Pacheco as a military post for the control of the natives. It is the center of a Roman Catholic bishopric, and has a cathedral, churches, a hospital, a penitentiary and other government buildings, a bull-ring, and a cock-pit. The city is well supplied with water by warm and cold springs. There is trade with the adjoining states, a mint, a gold refinery, glass works; and cotton, woolen, leather, and tobacco manufactories.

DURANTE, FRANCESCO, 1684-1755; an Italian composer, and one of the founders of the Neapolitan school of music. He was chapel-master in Naples, and in 1742 was at the head of the Conservatorio Santa Maria di Loreto in that city. He had unexampled fame as a teacher, and the most celebrated masters of the earlier school of Italian opera were among his pupils. Under Durante the Neapolitan school reached the climax of its celebrity, and it was in this school that the great traditions of Italian vocal art were established. As a composer he adhered to the severe style of the early Italian masters.

DURBIN, JOHN PRICE, D.D., 1800-76; b. Ky. At an early age he entered the Methodist itinerant ministry, studied while preaching, graduated at Cincinnati college, and was made professor of languages in Augusta college, Ky. In 1831, he was chaplain to the U. S. senate; in 1832, editor of the *Christian Advocate and Journal*; in 1834, president of Dickinson college; subsequently traveled in Europe, and in 1844 was prominent in the great slavery discussion which divided the church. He left the college in 1845, and was pastor in Philadelphia and presiding elder of the district. From 1850 to 1872, he was secretary of the missionary society, and to his exertions that society owes much of its success. He published *Observations in Europe, principally in France and Great Britain*, and a similar work on Palestine, Syria, and Egypt.

DURESS (*ante*), a legal term, signifying personal restraint, or fear of personal injury or imprisonment, imposed upon a person to constrain him to perform some act injurious to himself or another; as when a man's life is threatened or his liberty restrained to compel him to sign a bond, or to relinquish some right, or to commit a misdemeanor. A bond signed under D. is voidable in law. The same is the case when the violence or the threat thereof is exercised on the wife, or husband, or other near kindred of the contracting party. The violence or threats must be such as are fitted to operate upon a person of ordinary firmness and to inspire a genuine fear. If a man's goods be in D.—that is unlawfully detained—and he pay money under protest to release them, a suit will lie for its recovery.

DURFEE, JOB, LL.D., 1790-1847; b. and d. in R. I. He graduated at Brown university in 1813; studied law; was elected to congress in 1820, and served four years; was chosen a number of times to the state legislature, and in 1828 was speaker of the lower house. In 1833, he was appointed associate justice of the state supreme court, and became chief-justice in 1835. He was the author of *What Cheer*, a poem in nine cantos, and of *Punited*, a treatise to prove the presence of God throughout all nature.

DURHAM, a co. in Ontario, dominion of Canada, on lake Ontario, intersected by the Grand Trunk and Midland railroads; 620 sq. m.; pop. '71, 37,381. Chief town, Port Hope.

DUROC, GÉRARD CHRISTOPHE MICHÉL, 1772-1813; Duke of Friuli; a French gen. who served in the wars of the revolution, in the army of Italy, and in the Egyptian campaign. He was a prominent actor in the overthrow of the directory, and was appointed lieutenant-gen. and governor of the Tuileries. He went on diplomatic service to Sweden, Denmark, Russia, Prussia, and Saxony. In the battle of Austerlitz he was Oudinot's successor; and was near Napoleon in the subsequent campaigns. At the battle of Bautzen, while escorting Napoleon to a position that would overlook the field, Duroc was struck by a cannon-ball, and died soon afterwards. Napoleon afterwards bought the house where he died, and built on the spot a monument to his memory.

DURYEA, JOSEPH TUTHILL, D.D., b. Long island, N. Y., 1832; a graduate of the college of New Jersey, where he was teacher of Greek and rhetoric; in 1859, graduated at Princeton theological seminary; pastor of a Presbyterian church, Troy, N. Y., 1859-

62; in 1862-68, associate minister of the Collegiate Reformed church of New York; in 1868-79, pastor of Classon avenue Presbyterian church, Brooklyn; since 1879, pastor of the Central Congregational church, Boston. He is a broad and deep thinker, and his literary style is careful and finished, though his preaching is mostly without notes.

DÜSSELDORF SCHOOL OF PAINTING. This institution, founded in Düsseldorf by prince Charles Theodore in 1767, did not become famous until, in 1822, it was reorganized by king Frederick William, and put in charge of Cornelius, under whose direction it took at once a high rank. Cornelius was succeeded in 1826 by Schadow, and in 1859 by Bendeman. From 1864, the institution was managed by curators, till in 1873, Wiselinius of Weimar was chosen director. The school has exerted a wide influence upon art, in America as well as in Europe. Several of the most famous American artists have studied there, and among those who have done much to introduce and popularize its methods and style in this country may be mentioned Eastman Johnson, George H. Hall, Leutze, and Bierstadt. The academy possesses 14,000 original drawings and sketches by the great masters, and 24,000 engravings. The German artists whose names have become most familiar in connection with the school are Cornelius, Lessing, Achenbach, Baur, Tidemann, and Knaus.

DUTCHESS, a co. in s.e. New York, on the e. side of the Hudson river, crossed by the Hudson river, the Harlem, the Dutchess and Columbia, and the Poughkeepsie and Eastern railroads; 810 sq.m.; pop. '75, 76,334; in '80, 79,273. It has a rolling and in some places hilly surface, and the soil is for the most part very fertile. Wappinger falls and Fishkill creek supply water-power. Limestone, slate, and marble are abundant, and lead and iron are found in some places. The productions are wheat, rye, corn, oats, buckwheat, potatoes, hay, garden vegetables, butter, fruit, etc. There are in the co. about 900 manufacturing establishments. Co. seat, Poughkeepsie.

DUTCH LANGUAGE AND LITERATURE (NETHERLANDS, ante). Dutch is the written dialect of the inhabitants of the Netherlands. It belongs to the Aryan family of languages and to the Teutonic division thereof. The alphabet consists of the same letters as the English, the vowels having essentially the same sound as in French. In the inflection of the nouns and in the general construction of words and sentences the language strongly resembles the German. The plural of the noun is usually formed by adding *en* or *n* to the singular. The language is characterized by great simplicity, directness, and force, the greater breadth of its inflections giving it some advantage over the English. It has great facilities for the formation of compound words, often a great convenience. In this respect it is superior even to the German. In many instances where the English are compelled in the formation of a technical word to borrow from the Latin or Greek, the Dutch resort to their own indigenous roots. Many nautical terms and phrases in common use among the English are derived from the Dutch. Some specimens of the Dutch language date as far back as the 9th century. They resemble low German, and show that the language had its origin in the same source as all the other Teutonic dialects. It is almost identical with the Flemish, the differences being mainly in orthography and pronunciation. Dutch literature, as distinguished from the Flemish, dates no further back than 1570. It has had, however, a very striking development. Among the distinguished scholars of the nation in the past may be mentioned Erasmus, Grotius, Arminius, Spinoza, and Boërhaave. In the earlier portion of the 17th c., the free commonwealth of Holland was distinguished above every other European nation for its devotion to literature, and it can hardly be said to have fallen much in the rear since that day. The nation has had and still has its eminent poets, historians, travelers, philosophers, scientists, and theologians, whose works have attained a high rank.

DUTCH REFORMED CHURCH. See REFORMED CHURCH IN AMERICA.

DUTCH SCHOOL OF PAINTING. This school holds a high and honorable place in the history of art, being marked by many excellences and illustrated by many eminent names. The school took its rise in a divergence from the schools of Germany at the beginning of the 15th century. Its founders were Hubert and Jan van Eyck, who united the majestic simplicity of the ancient Christian type with a close imitation of external nature and a homely strength characteristic of their country. Hubert van Eyck improved the method of painting in oil to such an extent that he is almost entitled to the honor of being its inventor. The altar-piece in St. Bavo, at Ghent, is the work of the brothers van Eyck. In its complete form it consisted of a center picture of the Worship of the Lamb, surmounted by pictures of God the Father, the Virgin, and St. John, and flanked by folding shutters relating to the principal subject. The parts of this picture—one of the most remarkable productions of modern art—are now separated, the upper and middle portions remaining at Ghent, the others being at Berlin. Two of Hubert van Eyck's most important works are his "Triumph of the Church" in the museum at Madrid, and "St. Jerome" in the gallery at Naples. An admirable specimen of Jan van Eyck's work is a picture of a man and woman in the British national gallery. The influence of these brothers was very extensive. Their pupils were numerous, and of them all, Rogier van der Weyden, who died in 1464, was the most eminent. "The Last Judgment," in the hospital of Beaune, and the "Adora-

tion of the Kings," at Munich, are his. Memling, one of his pupils, was remarkable for the refinement of feeling and the beauty of form displayed in his pictures. Some beautiful specimens of his work are in St. John's hospital, Bruges. "The Last Judgment" in the church of Our Lady, at Dantzic, is probably the best production of his pencil. His influence extended till nearly the end of the 16th century. Quentin Matsys was one of the earliest painters of those homely subjects of which so many examples are found in the Dutch school. His masterpiece, a "Deposition from the Cross," is in the Antwerp museum. Among the portrait painters of the Dutch school in the 16th c., several attained eminence in England. At the beginning of the 17th c. appeared the celebrated Rubens, the herald of a great revival of painting. His forms are gross, but full of life and power. His works are numerous, and specimens are to be found in almost every continental gallery. They may be studied to best advantage at Antwerp, Vienna, and Munich. His "Descent from the Cross," and its companion in the cathedral of Antwerp, are among his best productions. Vandyck, the celebrated portrait painter, was a pupil of Rubens. Some of his best work was done in England. The greatest of the Dutch painters, however, was Rembrandt, whose mastery of light and shade was wonderful, and whose works are now among the most precious treasures of art. His engravings are of equal merit with his paintings. The masters in *genre*, by which is meant the every-day life in art as contrasted with the grandeur of historical or devotional works, have been numerous in the Netherlands. In this department, Teniers, the elder and the younger, are eminent. Gerard Dow, a pupil of Rembrandt, was also celebrated in this line. Among the most noted marine painters of the Dutch school were Bonaventura Peters and Ludolph Backhuysen. In the 18th c., there was in Flanders and Holland, as well as elsewhere, a decline in the artistic spirit, which was followed in the 19th by a revival.

DUTIES. See CUSTOMS.

DUTTON, HENRY, LL.D., 1796-1869; b. Conn.; a graduate of Yale, and professor of law in that college. In 1854, he was elected governor of Connecticut; in 1861, he was judge of the superior court of errors. He compiled the statutes of the state, and prepared several digests.

DUUMVIRS, officers among the Romans appointed for special services, such as magistrates of colonies and towns, constructors and commanders of fleets, and municipal censors. In the eastern empire the people elected for one year *duumviri litorum*, who were to provide exhibitions of games at their own expense.

DUVAL, a co. in e. Florida, on the Atlantic, intersected by St. Johns river, and reached by the Jacksonville, Pensacola and Mobile and the Florida railroads; about 1000 sq. m.; pop. '70, 11,921-6,780 colored. The surface is level; chief productions, corn, sugar, and sweet potatoes. Co. seat, Jacksonville.

DUVAL, a co. in s.w. Texas, on the Rio Nueces; 1650 sq. m.; pop. '70, 1083. Stock-raising is the chief business. There is a railroad from Corpus Christi to the e. line of the county. Chief town, Concepcion.

DUVERGIER DE HAURANNE, JEAN, 1581-1643; a French theologian, native of Bayonne; studied at Louvain, and was fellow-student with Jansen. About 1611, Duvergier was made canon at Bayonne. In 1620, he was made abbot of St. Cyran. In Paris he formed a connection with the influential Arnauld family, and, with Angelique Arnauld, directress of the convent of Port Royal, he completely reformed that institution. By taking a leading part in the Jansenist controversy, he excited the enmity of the Jesuits, and at last he was suspected by Richelieu, and thrown into prison in March, 1638. No evidence was found against him, but to break his strong influence he was kept confined until the death of Richelieu. He was then set free, and at once recommenced his war upon the Jesuits; but about six months afterwards died of apoplexy.

DUVERNOY, GEORGES LOUIS, 1777-1855; a French naturalist, invited in 1802 by Cuvier to assist in making the latter's treatise on comparative anatomy. Duvernoy prepared the last three volumes of the work. He practiced medicine for 20 years. In 1827, he was chosen professor of natural history at Strasburg, where he published several papers on anatomical themes. In 1837, he was professor of natural history in the college of France, and in 1850 occupied the chair of comparative anatomy.

DUVEYRIER, HENRI, b. Paris, 1840. He was educated in Germany, and became acquainted with Dr. Barth, the African explorer. He made a trip to Africa in 1857-59, and published *Explorations of the Sahara*. In 1871, he served in the French army, and was for a time a prisoner of war.

DUXBURY, a t. in Plymouth co., Mass., on the n. shore of Plymouth harbor, reached by a branch of the South Shore railroad; 38 m. from Boston; pop. '70, 2,341. It is the landing place of the Atlantic cable from Brest, France. Fishing and ship-building are the leading industries.

DUYCKINCK, EVERT AUGUSTUS, 1816-78; b. N. Y.; graduated at Columbia college, 1835; in 1840, editor of *Arcturus*, a monthly magazine; in 1847, he and his brother George started the *Literary World*, and continued it till 1853. In 1856, the brothers finished the *Cyclopadia of American Literature*, an elaborate work in two large volumes,

to which, in 1865, Evert added a supplement. Among his publications are *Wit and Wisdom of Sydney Smith*; *Poems relating to the American Revolution*; *History of the War for the Union*; *National Portrait Gallery of Eminent Americans*; *History of the World from the Earliest Period to the Present Time*; and *Memoirs of Francis L. Hawks*.

DUYCKINCK, GEORGE LONG, 1823-63; b. N. Y.; brother of Evert A.; graduate of the university of New York, 1843. Besides his work with his brother, he was the author of *George Herbert of Bemerton*, and of lives of bishop Thomas Ken, Jeremy Taylor, and Latimer.

DWIGHT, EDMUND, 1780-1849; b. Mass.; graduated at Yale, and studied law. He was the founder of a firm in Boston which, by establishing great cotton mills, did much toward building up the manufacturing villages of Holyoke and Chicopee. He was also a leading promoter of normal schools in the state, to the establishment of which he gave a large sum of money.

DWIGHT, HARRISON GRAY OTIS, D.D., 1803-62; b. Mass.; graduated at Hamilton college in 1825; and at once went out under the direction of the American board to assist in the Armenian mission in Turkey, taking a position in Constantinople, where he soon became noted as one of the most zealous and successful workers in the Armenian field. While on a visit to the United States he was killed in an accident on the Troy and Bennington railroad. Among his works are *Researches of Smith and Dwight in Armenia*; *Memoirs of Mrs. Elizabeth B. Dwight*; *Christianity Revived in the East*; and a *Catalogue of Literature in Armenia*.

DWIGHT, JOHN SULLIVAN, b. Boston, 1813; graduated at Harvard, and became a Unitarian minister, in which office he continued about six years. He was one of the Brook Farm experimenters, holding on to the last. Having an excellent musical education, he was engaged by the New York *Tribune* to write a series of criticisms of Jenny Lind's performances, which were the first musical criticisms of any consequence that ever appeared in an American daily journal. Soon after the departure of the songstress he established (in 1852) in Boston *Dwight's Journal of Music*, of which he is still the editor.

DWIGHT, NATHANIEL, 1770-1831; a brother of Timothy of Yale. He issued the first geography for common schools published in the United States. Among other works by him are *A Compendious History of the Signers of the Declaration of Independence*, and *The Great Question Answered*.

DWIGHT, SERENO EDWARDS, D.D., 1786-1850; a graduate of Yale; at first a lawyer. In 1817, after studying divinity, he became pastor of Park street church, Boston. From 1833 to 1836, he was president of Hamilton college. Among his works are *Life of Jonathan Edwards* (his great-grandfather, whose works he edited), and *The Hebrew Wife*.

DWIGHT, THEODORE, 1764-1846; b. Northampton, Mass.; a lawyer and journalist. His mother was a daughter of Jonathan Edwards. In politics, he was an extreme federalist, and officiated as secretary in the Hartford convention. He was a brilliant writer and speaker, and was in congress, 1806-7. He edited the *Mirror*, Hartford, Conn.; then the *Albany Daily Advertiser*; and started the New York *Daily Advertiser* in 1817, and was its principal editor for eighteen years. His works were *Life and Character of Thomas Jefferson*, and *History of the Hartford Convention*.

DWIGHT, THEODORE, 1796-1866; son of the secretary of the Hartford convention; graduated at Yale, 1814; and turned his attention to authorship. Among his works are *Tour in Italy*; *Life of Garibaldi*; *School Dictionary of Roots and Derivatives*; *Northern Traveler*; *Tour in New England*; *Father's Book*; *First Lessons in Modern Greek*; *The Roman Republic of 1849*; and *The Kansas War*.

DWIGHT, THEODORE WILLIAM, LL.D., b. N. Y., 1822; graduated at Hamilton college; afterwards studied law, and was professor of that science in Hamilton college, where he started a school of law. In 1858, he became professor of law in Columbia college, New York. He has published several works on legal themes, among which are *Trial by Impeachment*; *Argument in the Rose Will and Charity Cases*; besides papers in the *American Law Register*, of which he was assistant editor. In 1868, he became non-resident professor of constitutional law in Cornell university, and, in 1869, lecturer in Amherst college. He has been member of the N. Y. state constitutional convention in 1867; president of the N. Y. prison association; and was one of the committee of seventy chosen by the people, without regard to parties, to bring about reforms and economy in the local government of New York city.

DWIGHT, WILLIAM THEODORE, D.D., 1795-1865; b. Conn.; graduated at Yale, 1813; admitted to the Philadelphia bar, 1821. About 1830, he turned his attention to theology, studied for the Congregational ministry, and (two years afterwards) became pastor of the Third church, Portland, Me. He published a memoir of his brother, Sereno Edwards Dwight, and a number of reviews and addresses. He was a man of commanding influence as a thinker, writer, and preacher.

DYAKS. See BORNEO, *ante*.

DYER, a co. in w. Tennessee, on the Mississippi; 606 sq. m.; pop. '70, 13,706. Soil rich, surface level, with extensive forests of white oak, walnut, poplar, etc. Corn, cotton, lumber, and tobacco are the chief products. Co. seat, Dyersburg.

DYER, ALEXANDER B., 1817-74; b. Va.; graduate at West Point, 1837. In 1864, he was appointed chief of ordnance with the rank of brig. gen. He served in the Florida war in 1837-38; in various arsenals, 1838-46; in the war with Mexico, 1846-48; in various arsenals, 1848-61; and in the ordnance board, 1859. He had charge of the Springfield armory, 1861-64, and served in the ordnance board, 1860-63, and as chief of ordnance in the ordnance bureau in Washington, from 1865 to his death.

DYER, MARY, one of the victims of the persecution that befell the Quakers in the early years of the Massachusetts colony. Their uncompromising attack on the organization of both the church and the civil state, led to the enactment by the legislature of a law of banishment against them under penalty of death if they should return. Mary Dyer left the colony for a time, but soon returned, when she was arrested and convicted, but on being led forth to execution was reprieved, and, against her will, conveyed out of the colony. Returning again, she was hanged on Boston common, June 1, 1660.

DYERS' BROOM, or WOODWAXEN (*genista tinctoria*), a leguminous shrub of European origin bearing yellow flowers and simple leaves, and said to be the bush genêt, from which the Plantagenet family took its name. It is used in Russia for preventing hydrophobia; and formerly in this country its tops were domestically used for a yellow dye, and it was extensively cultivated in New England. Its medicinal value appears to be small.

DYERS' WEED, or ROCKET (*reseda luteola*), a European herb, naturalized in the region of New York, resembling the mignonette. It was formerly used for medicinal purposes, but is now valued chiefly as material for a yellow dye, for which purpose it is largely cultivated in some parts of Europe.

DYMOND, JONATHAN, 1796-1828; an English writer, a member of the Society of Friends. He was an expositor of the moral principles of his sect, and though actively engaged in business, published, in 1823, an *Inquiry into the Accordance of War with the Principles of Christianity*, which attracted wide attention. He also wrote *Essays on the Principles of Morality, and on the Private and Political Rights and Obligations of Mankind*, published after his death.

DYNAMETER, an instrument for measuring the magnifying power of a telescope. The power of a telescope is found by dividing the solar focal distance of the object glass by the focal distance of the eye-piece; which quotient equals that of the effective diameter of the object glass, by the diameter of the image formed at the solar focus, and seen through the eye-piece. The object of the dynameter is to measure the diameter of this image. Ramsden divided a positive eye-piece into two equal parts, and caused the halves to slide along at the dividing line, by means of a fine screw apparatus. Each half lens gives a separate image, and the distance of the two centers, measured by the turns of the screw which bring the images into contact, gives the distance between the centers of the images, or the diameter of one of them.

DYNAMIC UNITS are units for measuring forces and their effects. It is an axiom of mechanics that if a body at rest be impressed by a force, and meet no resistance other than its own inertia, it will move in a straight line with a velocity which varies as the force; e.g., twice the force will develop twice the velocity. Also, if the mass of the body be increased, the force must be increased in like ratio to maintain the same velocity; e.g., double the mass will require double the force; or, if the force remain unchanged, double the mass will move with half the velocity. Combining the two statements, we find that the velocity varies directly as the force, and inversely as the mass; velocity equals force divided by mass, or $v = \frac{F}{M}$. From this we have $F = Mr$. The unit of force is that force

which will impart a unit of velocity to a unit of mass; that is, which will cause a unit of mass to move through a unit of space in a unit of time. If the force considered be that of gravitation, whose action in the same place is practically uniform, and if we remember that the measure of the force of gravitation in a body is the weight of the body, we have $W = Mr$. But if the mass be submitted to the force of gravitation, that is, if it be permitted to fall freely in a vacuum, it traverses a space of 32.16 ft. in one second, at New York, approximately. We have then, by experiment, a value for r which makes our equation $W = M \times 32.16$, whence $M = W \div 32.16$. The English or American unit of force is one pound avoirdupois; and the corresponding unit of mass is 1 lb. divided by 32.16.

The unit of work is the force which will raise a unit of weight through a unit of space. The two items are indicated in the name foot-pound, which by analogy might be exchanged in proper ratio for inch-ounce, ton-mile, etc. The corresponding French unit of work is the kilogram-meter. More generally the foot-pound is the work of a unit of force acting through a unit of space. The horse-power is an arbitrary unit, being the force required to perform 33,000 units of work in one minute. It may be called the unit of the rate of working. The French *cheval a vapeur* is 75 kilogram-meters per second, and is equal to 32.550 foot-pounds per minute, or a little less than our horse-power.

The theoretical horse-power is merely a conventional quantity, the actual work of horses averaging about 17,000, and rarely exceeding 22,000 foot-pounds per minute.

DYNAMOMETER, a device for measuring the force which does work in overcoming resistance and producing motion. The foot-pound, as a unit of work, has for its factors the force acting and the distance through which it acts. The larger unit, the horse-power, besides these factors has a third, the time during which the force is exerted. Hence, in getting the data from which the work of a machine is to be calculated, we are to observe the force, the distance, and the time required to accomplish a certain result. Strictly speaking, the dynamometer indicates the first of these items, but it may be so arranged as to show both the others. Dynamometers are designed to indicate the force of *traction, of thrust, or of rotation*. A traction dynamometer may be interposed, for example, between a team of horses and a reaper or a plough, to measure the force exerted by the horses in drawing the machine. It is usually some sort of spring balance, fitted with an index and a scale; the figures on the scale show the number of pounds required to bring the index to the corresponding points, if the instrument were hung up and weights suspended by it. A dynamometer for thrust is often connected with the screw-shaft of a steamship, to measure the force with which the screw is driving the vessel through the water. Rotary dynamometers measure the force of a mill-shaft, either by showing what force is required to hold the shaft in check, by absorbing the motion, or what force the shaft transmits to other machinery. Nearly all forms of dynamometers are too complex to be described without the help of elaborate drawings and technical descriptions, for which the reader is referred to special works on mechanism. The use of the dynamometer in skillful hands has acquired great value in exchanging the rough and usually overestimated guesses of the efficiency of machines for the exact determination of their performance.

DYRRHA'CIUM. See *DURAZZO, ante*.

DYSENTERY (*ante*). Two forms of dysentery are usually recognized by medical authorities, sporadic and epidemic. The causes, however, are supposed to be the same in both. It is essentially a disease of hot weather, or hot climates. There being no doubt of the epidemic character of the disease in certain seasons and in certain localities, it follows that a peculiar poison must be the generating cause, heat perhaps operating to aid in generating the poison or contagious matter. Post-mortem examinations show the mucous membrane of the colon and rectum (see *ALIMENTARY CANAL*) to be the seat of much morbid action. Extensive ulcerations are frequently found, which are the seats of the hemorrhage or bloody discharges, having been caused by the inflammation of the parts, abundant evidence of which exists, the membrane often being found greatly engorged with blood, thickened and pulpy, in some cases of a very dark color and almost disorganized. The portal circulation (see *LIVER*) is greatly obstructed in nearly all cases, probably in all severe cases, and it is certain, under the circumstances, that the peculiar *materies morbi* or morbid principle or matter of dysentery paralyzes or greatly arrests the functions of this organ. Now, as all the blood from the intestines passes through the liver on its return to the lungs and heart, the functional disturbance which exists in this organ must necessarily produce more or less obstruction in the capillary circulation in the intestines, and greatly interfere with their nutrition and relative functions. Practically, therefore, the treatment of the disease involves the consideration of those remedies which are supposed to exert a decided influence upon the functions of the liver. One of these remedies, which has been greatly lauded, and also greatly condemned, is mercury, particularly that preparation of it called *calomel*; one party contending that the administration of the drug in minute and repeated doses (especially when alternated with alkaline carbonates to restore the alkalinity of the blood) exerts a powerful influence in restoring the tone of the capillary circulation in various organs, and consequently their functional activity; above all, that this power is peculiarly manifested with reference to the liver; and they adduce numerous examples to establish the correctness of their opinions. On the other hand, several eminent authorities deny the correctness of the theories and positions of these advocates, and affirm that their experience and experiments, as well as all sound therapeutic theories, are decisive against the opinion that calomel possesses the peculiar virtues which are claimed for it. If this remedy be used, it should be in minute and frequently repeated doses— $\frac{1}{4}$ to $\frac{1}{2}$ of a grain every 2 hours; and sometimes oftener— $\frac{1}{4}$ to $\frac{1}{2}$ of a grain every hour. It should always be combined with sufficient opium in some form to allay the griping and other pain, and arrest the straining. Alkaline carbonates should also be given. It is recommended by many authorities that when a laxative is given in the commencement of the treatment, a saline, as sulphate of magnesia or Rochelle salts, should be preferred. Hygienic measures are of the greatest importance. The strictest attention should be paid to cleanliness and ventilation. Pure, fresh air is necessary, not only as a tonic to the nervous system, but as one of nature's principal means of eliminating effete and poisonous matter. Counter-irritants in the form of sinapisms, made weak and continued, are frequently of great advantage in aiding to restore the capillary circulation in the diseased parts, by arousing a reflex influence in the nervous system. The diet is of no secondary importance, and should be bland and nutritious. Eggs, raw or very slightly boiled, mixed with Catawba or sherry wine, or

brandy; rice water, as a beverage, combined or alternated with beef-tea, will often afford nourishment not easily supplied in other ways. Rare beefsteak, if chewed and the juice swallowed, often affords a good form of food; toast and tea also may be taken. Tea for the sick-room should always be of the most delicious kind, and freshly prepared, and *weak*. Pure water, actively boiling, should be poured upon a proper quantity of tea in an earthen vessel, and allowed to stand not more than two or three minutes before being turned off, as the continued presence of the leaves allows of the absorption of too much tannin and other extractive matter, by which the fragrance and best qualities of the beverage are injured.

DYSPILO'NIA, signifying primarily difficult speaking, of which the most common example is the disease popularly known as "clergyman's sore-throat." It is attended with inflammation, huskiness, coughing, expectorating, and sometimes ulceration. Rest of the vocal organs, muscular exercise, tonics, and change of air and scene, are helpful towards recovery. It is a recent theory that, with preachers, this trouble arises from the forcible use of the voice only one day in seven, after six days of quietness—the injury arising not from the use, but from the sudden and violent change involved in the use; thus indicating as a remedy or preventive such daily vocal exercise as shall avoid a sudden strain on any one day.

DZUNGA'RIA, or SONGARIA, a former Mongolian kingdom of central Asia, destroyed by the Chinese invasion about 1757–59. It included most of that part of central Asia extending from 35° to 50° n., and from 72° to 97° east. A part of this territory is now known as the Chinese province of Thian-Shanpelu.

E

EACHARD, JOHN, D.D., 1636–97; an English divine, educated at Cambridge, where he became master of Catherine hall. He was a doctor of divinity, and for two terms vice-chancellor of the university. He published a number of half-satirical attacks upon the clergy, among them *The Ground and Occasions of the Contempt of the Clergy inquired into, in a Letter to R. L.*; and, in answer to attacks upon this work, he issued *Some Observations, etc., in a Second Letter to R. L.* He attributed the contempt into which the clergy had fallen to their imperfect education, their insufficient incomes, and the want of a true vocation, giving amusing illustrations of the poverty and absurdity of the pulpit oratory of the day. In a similar vein of satire, he attacked the philosophy of Hobbes. Swift called him a successful humorist who failed as a serious writer.

EADIE, JOHN, D.D., LL.D., 1810–76; b. Scotland; educated at Glasgow university, and in 1835, ordained minister of the Cambridge street Secession church in Glasgow. In this position he took part in the union, in 1847, of his denomination with the Relief church, under the name of the United Presbyterian church. He became the leading representative of the latter denomination. Most of his written works were in connection with biblical criticism and interpretation. Among them were a *Biblical Cyclopædia*; an *Analytical Concordance*; *Early Oriental History*; *Life of Dr. Kitto*; and *History of the English Bible*.

EADS, JAMES B., b. Ind., 1820; in early life engaged in navigation on the western rivers; went into the business of recovering sunken boats and cargoes, in which he made a fortune. When the rebellion began he offered plans for the defense of the western rivers, and undertook the construction of iron-clad gun-boats. In 1862, he built six iron-proof propellers, having two turrets each, in which he tried many of his own inventions. He is the constructor of the Illinois and St. Louis bridge, and of the important works for deepening the channel at the mouths of the Mississippi. See **JETTY**.

EAGLE WOOD, an East India tree of which there are three varieties, containing much resin, and an oil which the natives esteem highly as a perfume or incense. Some of the trees are naturally inodorous, but after a disease which often attacks them the wood becomes colored and gives out a powerful scent. It is supposed to be a cure for gout, and in Europe is sometimes prescribed for rheumatic affections.

EARLE, PLINY, 1762–1832; b. Mass.; inventor of machinery for making cards (for carding wool), by which he reduced the labor of hours to as many minutes. He was more than usually well informed in science and literature.

EARLE, PLINY, b. Mass., 1809; son of Pliny the inventor; educated at a Quaker school in Providence; licensed to practice as a physician in 1837; in 1840, was resident physician in the insane hospital at Frankford, Penn.; in 1844, physician to the Bloomingdale (N. Y.) insane asylum; after 1849, visited all the important insane asylums in Europe; in 1853, became physician to the New York lunatic asylum. Among his publications are: *Marathon and Other Poems*; *Visit to Thirteen Asylums for the Insane in Europe*; *History, Description, and Statistics of the Bloomingdale Asylum*; and many articles in the *American Journal of Insanity*.

EARLE, THOMAS, 1796–1849; b. Mass.; brother of Pliny the physician. When young he settled in Philadelphia, where he became a journalist and lawyer. He was

active in the Pennsylvania constitutional convention in 1837, and is credited with having made the original copy of the new constitution. In 1840, the liberty party made him their candidate for vice-president, probably because he had broken away from the democratic party by advocating the extension of the right of suffrage to colored men. He published *Essay on the Penal Law*; *Essay on the Right of States to alter and annul their Charters*; *Treatise on Railroads and internal Communication*; *Life of Benjamin Lundy*; and a school spelling-book. At the time of his death he was about finishing a history of the French revolution. In early life he edited the *Columbian Observer*; *Standard*; *Pennsylvanian*; and *Mechanics' Free Press and Reform Advocate*.

EARLY, a co. in s. w. Georgia, on the Alabama border, partially crossed by an extension of the Brunswick and Albany railroad: 500 sq. m.; pop. '70, 6,998—4,172 colored. The surface is level and the soil fertile, producing corn, cotton, etc. The Chattahoochee, on the w. border, is navigable for steamboats. Co. seat, Blakeley.

EARLY, JUBAL A., b. Va., 1818; graduated at West Point, 1837; served in the artillery in the Florida war. He resigned in 1838 to study law; became a member of the bar and of the Virginia legislature, and state attorney. In the war with Mexico he served as major and colonel. He was among the first to volunteer in the service of the rebellion, and at Bull Run was in command of a brigade. Two years later he was brig. gen., and had command of a division at Gettysburg. In 1864, he made a raid through the valley of the Shenandoah, invaded Pennsylvania, and partially burned Chambersburg. The tide of his success was turned by the union gen. Sheridan, who defeated him at Opequan, at Fisher's hill, and at Cedar creek, and he was routed by Custer at Waynesborough. On account of these disasters he was dismissed from the confederate service. After a trip to Europe, he returned to Richmond, and resumed the practice of law.

EAR SHELL, *Haliois*, a marine mollusk, of which the shell is used for inlaying and other ornamental purposes, and for decorating walls. They resemble the human ear in shape; are from 6 to 8 in. long, and 5 or 6 wide; are found in all temperate and tropical seas, and in some countries are used for food, being obtained at low tide in deep water, where they are found adhering to the rocks. There are about 75 living species, and a few fossils have been found.

EARTH-CLOSET. See **SEWAGE EARTH-CLOSET**, *ante*.

EARTH-SHINE, the reflection from the moon of the light cast upon her by the earth, particularly noticeable in clear nights at the time of new moon, when sometimes the whole surface of the moon can be seen in ashy colored light. The earth serves the same purpose to the moon that the moon does to the earth; that is, the earth is the moon's moon, and would present to an observer on the moon the same phases that the moon does to us; but the earth would, to an observer from the moon, appear four times as large as the moon does to us. When it is new moon to us, it is full moon to an observer on the side of the moon facing the earth, and, as the earth is much the larger, it gives to the moon about 16 times as much light as the full moon gives to us. This light, reflected back to us, is known as earth-shine. It is really the light of the sun reflected by the earth to the moon, and by the moon back to the earth.

EASEMENT (*ante*), a legal term signifying some right of the public, or of an individual, in lands owned by another; a right existing either at common law or by statute; such, for example, as the right of way across another's estate, or to receive water from, or discharge it across, such estate. The E. is either affirmative or negative; affirmative when the owner of an estate is entitled to do something on the estate of another; negative when he is forbidden to do something, otherwise lawful, on his own premises. It may arise from the nature of things, or from special contract, express or implied. It is an E. when the owner of land makes a grant thereof for public use, as for a road or park, whereby the public gains only a right of use for the purpose specified, the title still remaining with the grantor. An E. in the land of another may also be acquired by prescription—that is, by the continuous and open enjoyment of a privilege without objection for a certain term of years. Easements may be extinguished by release or abandonment, or by a union of the two estates in the same person.

EAST ABINGTON, a village in Plymouth co., Mass., 20 m. s. e. of Boston, on the Old Colony railroad; pop. 4,500. The principal business is the manufacture of boots and shoes.

EAST BATON ROUGE, a parish in s. e. Louisiana, between the Mississippi and Amite rivers, 450 sq. m.; pop. '70, 17,816—11,343 colored; in '80, 20,016. Surface, generally level, with fertile soil, producing corn, cotton, sugar, molasses, etc. Seat of justice, Baton Rouge.

EAST BIRMINGHAM, Penn. See **PITTSBURG**.

EAST BRIDGEWATER, a t. in Plymouth co., Mass., 25 m. s. e. of Boston, on the Old Colony and Newport railroad; pop. '70, 3,017. There is abundant water power, and manufacturing is the leading business.

EASTBURN, **JAMES WALLIS**, 1797—1819; b. England; came to America when a child; graduated at Columbia college in 1816, and studied theology with the purpose of

taking orders in the Episcopal church. While a student he began a new metrical version of the Psalms. He was joint author with Robert C. Sands of *Yamoyden*, a romance founded upon the life of Philip, the Narragansett king; and he wrote many small poems. In 1818, he was ordained and took charge of a church in Virginia, but died while on a voyage to the West Indies for his health.

EASTBURN, MANTON, D.D., 1801-72; b. England; brother of James Wallis; came to the United States when a child; graduated at Columbia college, 1817; studied in the Episcopal theological seminary, and was ordained to the ministry, 1825. He was for several years rector of the church of the Ascension, New York, and in 1843 became bishop of Massachusetts. He published *Lectures on Hebrew, Latin, and English Poetry; Essays and Dissertations on Biblical Literature; Lectures on the Epistle to the Philippians*; and many sermons and addresses. He gave the most of his property to religious and benevolent institutions.

EASTER (*ante*). The following are the dates for the occurrence of E. in each year from 1880 to the end of this century:

1880, March 28.	1885, April 5.	1890, April 21.	1893, April 2.	1897, April 18.
1881, April 17.	1886, April 25.	1890, April 6.	1894, March 25.	1898, April 10.
1882, April 9.	1887, April 10.	1891, March 29.	1895, April 14.	1899, April 2.
1883, March 25.	1888, April 1.	1892, April 17.	1896, April 5.	1900, April 15.
1884, April 13.				

Other principal days of observance may be found by reckoning from Easter. The first day of Lent (Ash Wednesday) is Wednesday in the 7th week before Easter. The Crucifixion day (Good Friday) is the Friday before Easter. The Ascension day is Thursday, the 40th day after Easter. The Pentecost day (Whitsunday) is the 50th day after E., or the Lord's day 7th after Easter.

EASTERN ARCHIPELAGO. See MALAY ARCHIPELAGO, *ante*.

EASTERN CHURCHES include: I. The Greek church, which contains in Russia about 55,000,000; in Turkey, 11,500,000; in Austria, 3,000,000; in Greece, 1,225,000; and in the United States (chiefly in Alaska), 50,000; in all, more than 70,000,000. II. Armenians, 3,000,000. III. Copts and Abyssinians, 3,000,000. IV. Jacobites (in Turkey and India), 220,000. V. Nestorians, including the Christians of St. Thomas, in India, 165,000. The total in them all is about 76,500,000.

EASTERN EMPIRE. See BYZANTINE EMPIRE, *ante*.

EASTERN QUESTION, in popular usage, is the problem of the future disposition of the Turkish empire and its territory, as related to the supposed designs of Russia, and to the interests of other European nations, England and Austria in particular. Voltaire, in the time of Catherine II., characterized Turkey as "the sick man," and for a hundred years it has been an assumption of European diplomacy that the empire was on the road to disintegration and death. In these circumstances, Russia, from her geographical position and in accordance with her traditional policy, waits for an opportunity to seize and absorb the territory of "the sick man." Other European nations, each for reasons of its own, dread such an extension of Russian domination. Austria, if Turkey should be despoiled, would naturally claim for herself a slice of the territory; and England fears that if Constantinople should fall into the possession of Russia, the highway to her eastern possessions would be closed, and Russia become dominant in that quarter. The question, moreover, assumes a religious aspect, Turkey being a Mohammedan power, and Russia finding an excuse for aggressive designs in the assumed necessity of affording protection to the Christian populations in the Turkish empire. England, on the other hand, though at the head of the Christian powers, yet being anxious to preserve the autonomy of Turkey as a subservient empire, is placed in a position of seeming indifference to the wrongs which Russia is so zealous to redress. The Crimean war of 1854-56 had its origin in the desire to check the advance of Russia, and the treaty of Paris put that power under sharp restrictions. Russia, by the recent invasion of Turkey, roused again the hostility of the European powers, which found expression in the treaty of Berlin, greatly limiting the fruits of the Russian conquest, and putting that empire under annoying restraints. Turkey was made to promise certain reforms, which, if carried into effect, would deprive Russia of excuse for further aggressions; but the promise has not been and is not likely to be fulfilled: it is doubtful indeed whether the fulfillment is within the power of Turkey. The eastern question, therefore, has not yet reached a permanent solution, nor is its approach to such a solution now evident, especially as complications arising from the claims of Greece to an adjacent portion of Turkish territory are assuming (1880) a more threatening aspect.

EASTERN, or ORIENTAL RITE, the name given to the rituals of the Armenian, Coptic, Greek, and Syrian Roman Catholics, who, acknowledging the supremacy of the pope of Rome, have been allowed to retain their own modes of performing divine worship. These differ from the Latin, not only by being in the language common among the people, but also in continuing "communion in both kinds" to the laity, and marriage to the lower clergy. Among these branches of Roman Catholics there are about 80 bishops, of whom 5 are patriarchs and 26 archbishops.

EASTERN SHORE, the counties of Accomack and Northampton in Virginia, and all of Maryland lying e. of Chesapeake bay (sometimes including Delaware also). It is a fertile region, famous for its product of peaches and garden vegetables, and equally famous for oysters. The country, though low and level, is generally healthful, and the climate is mild and equable. It is intersected by railroads, and there is abundance of steam-boat navigation. Until invaded by railroads and overrun by small owners, this was the "blue blood" section of Virginia, noted for aristocracy and hospitality.

EAST FELICIANA, a parish in s.e. Louisiana, on the Mississippi and Amite rivers, reached by the Clinton and Port Hudson railroad; 500 sq.m.; pop. '70, 13,499—9,393 colored. It is generally level, well-watered, and fertile; producing corn, cotton, rice, etc. Seat of justice, Clinton.

EAST HADDAM, a t. in Middlesex co., Conn.; on the e. bank of the Connecticut river, about 16 m. from its mouth, and 30 m. below Hartford; pop. '70, 2,951. It has considerable cotton manufacture and some trade. The surface is hilly; and among the hills in the n.e. part, near the river, remarkable subterranean noises, as of rumbling and jarring, have occasionally been heard, though of late years more rare than formerly. The sound is called "Moodus noise," from the name given to the region by the Indians, who ascribed to the sound a supernatural origin. Its cause has not been ascertained.

EAST HAMPTON, a t. in Hampshire co., Mass., on the New Haven and Northampton railroad, in the beautiful valley of the Connecticut, 5 m. s.w. of Northampton; pop. '70, 3,620. Its manufactures are various and extensive. It has a good public library, many good schools, and fine public buildings, such as a town-hall and churches. Williston seminary for young men, founded here by Samuel Williston, and endowed by him with more than a quarter of a million dollars, is a school of the highest grade below the collegiate, and has for many years attracted large numbers of students.

EAST HAMPTON, a t. in Suffolk co., N. Y., comprising the e. end of Long Island, including the peninsula of Montauk; reached by the Long Island railroad; pop. '75, 2,299. Much of the land is a narrow, sandy tract, between the ocean and the sound, of little value. The w. portion is fertile, producing fruits, vegetables, etc. The extreme e. part, known as Montauk, is a breezy, grassy upland, scarcely inhabited, affording fine pasturage to immense herds of cattle. The village of East Hampton is 7 m. s.e. of Sag Harbor, and a mile from the ocean. It is an agreeable and popular summer resort.

EAST HUMBOLDT MOUNTAINS, in Elko co., Nevada; a range with peaks 15,000 ft. high; for the most part well-wooded. Fremont's pass is in this range.

EASTLAND, a co. in n.w. Texas, on Leon river; 900 sq. m.; pop. '70, 88. Cattle raising is the only industry.

EAST LIVERPOOL, a village in Columbiana co., O., on the Ohio river, and the Pittsburg and Cleveland railroad; pop. '70, 2,105. Manufactures of pottery, china, and parian ware are among the leading industries.

EASTMAN, CHARLES GANAGE, 1816–61; b. Me.; removed with his parents to Vermont, and was editor of the *Burlington Sentinel*, *Spirit of the Age*, and *Vermont Patriot*. He was a member of the state senate for several years. In 1848, he published a volume of poems.

EASTMAN, MARY HENDERSON, b. Va., 1818; daughter of Dr. Thomas Henderson, and wife of capt. Seth Eastman, of the U. S. army. He was stationed for several years in the Indian country, where his wife wrote *Dahcotah, or Life and Legends of the Sioux; Romance of Indian Life*; and other works of the kind. In 1852, she published *Aunt Phillis's Cabin*, in response to Mrs. Stowe's famous *Uncle Tom's Cabin*. She has also published the *American Aboriginal Portfolio*, and *Chicora and other Regions of the Conquerors and the Conquered*.

EAST NEW YORK, a large village or city adjoining the city of Brooklyn, in Kings co., N. Y. It may be considered a part of Brooklyn, having no distinctive features of its own. It is mainly on a high ridge, and affords a fine view of the rich garden lands in the s. part of Kings co., the numerous villages, Jamaica bay, and the ocean beyond, Coney island, and Rockaway beach. The pop. is about 12,000.

EASTON, JAMES, b. Conn. He was a col. in the revolutionary army, raising a regiment by his own exertions, and spent his entire fortune for the service. He was one of the leaders in the capture of Ticonderoga, and brought the news of the victory to the provincial congress. He was also with Montgomery in the invasion of Canada. In Jan., 1776, he received the thanks of congress, but was forced through the enmity or jealousy of Benedict Arnold to quit the service in that year.

EASTON, NICHOLAS, b. Wales, 1593; d. R. I., 1675. He came to Massachusetts, 1634; in 1638, he removed to Rhode Island, and built the first house in Newport. He was governor of the colony in 1650. His son John was governor in 1690–95, and was the author of a *Narrative of the Causes which led to King Philip's War*.

EAST ORANGE, a t. in the co. of Essex, N. J., lying between Newark on the e. and Orange on the w., and on the line of the Delaware, Lackawanna and Western railroad, by which it is connected with New York and the west. It is growing rapidly; and

has an intelligent and thriving population, being the residence of a large number of people doing business in New York. It has 10 or 12 churches, excellent schools, a weekly newspaper, and numerous handsome private residences. The principal streets are macadamized; many of them are bordered with fine shade-trees, and lighted with gas. Pop. '70, 6,500.

EAST SAGINAW, a city in Saginaw co., Mich., at the head of steamboat navigation on the Saginaw river, 17 m. from its mouth. It is on the Flint and Père Marquette, and the Jackson and Saginaw railroads, and is the terminus of the Saginaw Valley and St. Louis railroad. Pop. '74, 17,084. It has an important lumber and salt trade, sending out 135,000,000 ft. of lumber annually from its 17 saw-mills, and 200,000 barrels of salt. It is handsomely laid out, and built; and has horse railroads and water-works. It is the prosperous center of a fertile surrounding country; the yearly increase of population having reached 40 per cent. The city of Saginaw is on the opposite side of the river.

EATON, a co. in s. Michigan, on Grand river, intersected by the Chicago and Lake Huron, and the Grand River Valley division of the Michigan Central railroad; 576 sq.m.; pop. '74, 26,907. The surface is undulating, and the soil productive. Wheat, corn, barley, maple sugar, butter, and wool are the chief staples. Co. seat, Charlotte.

EATON, Amos, 1776-1842; b. N. Y.; graduated at Williams college in 1799, and became a lawyer and surveyor at Catskill, N. Y. He studied natural sciences and lectured on botany, chemistry, geology, and mineralogy, and with Drs. T. Romeyn Beck and Lewis C. Beck he made a geological survey of Albany and Rensselaer counties. In 1820, he was professor of natural history in the medical college at Castleton, Vt. In 1824, he was at the head of the Rensselaer school of science in Troy. He published many works on botany, chemistry, geology, natural history, and agriculture.

EATON, Amos B., b. N. Y., 1806; graduated at West Point in 1826, and entered the army as officer of infantry. After service on the northern frontier, he was transferred, in 1838, to the department of subsistence, and served as commissary in Florida, on the Canada border, and in New York. In the Mexican war, he was chief commissary under maj.gen. Taylor, and in 1851-55 he was in the department of the Pacific. During the war of the rebellion he was depot commissary at New York city, and purchasing commissary stores for the armies in the field, and after 1864, head of the commissary bureau at Washington. He was made brevet maj.gen. for faithful, meritorious, and distinguished services.

EATON, GEORGE W., D.D., LL.D., 1804-72; b. Penn.; a Baptist minister, educated in Ohio university and Union college, and tutor in the last named institution in 1829. In 1831, he was professor of ancient languages in Georgetown (Ky.) college; 1833-50, professor of mathematics, natural philosophy, and ecclesiastical and civil history in the literary and theological institution at Hamilton, N. Y.; afterwards at the same place professor of systematic theology; 1856-68, president of Madison university; also, 1861-71, president of the theological institution.

EATON, JOHN, JR., PH. D., b. N. H., 1829; graduated at Dartmouth in 1854, studied theology at Andover theological seminary; ordained by the Maumee (O.) presbytery, 1861; commissioned chaplain of the 27th Ohio volunteers, 1861; appointed by gen. Grant superintendent of contrabands, 1862; general superintendent of freedmen for Mississippi, Arkansas, w. Tennessee, n. Louisiana, 1862, serving till May, 1865. He was commissioned col. of the 63d colored troops, 1863; breveted brig.gen. of volunteers, 1865; assistant commissioner of the bureau of refugees, freedmen, and abandoned lands, 1865; state superintendent of public instruction for Tennessee, 1867-69; and U. S. commissioner of education, 1870. He has published many reports, chiefly upon education and the public affairs in which he participated; and established and edited, 1866-70, the *Memphis Daily Post*.

EATON, WILLIAM, 1764-1811; b. Conn.; at 16 years of age, entered the revolutionary army and served through the war. Entering Dartmouth college, he graduated in 1790, and in 1792 was made a capt. in the regular army; in 1797, sent as diplomatic agent to Tunis, where he succeeded in putting an end to the outrages of the corsairs of that country upon American ships. In 1803, he returned, but the next year went back as navy agent of our government for the Barbary states. There was at the time a contest for the throne of Tripoli, with which country this nation was at war. Eaton found that the rightful bey, or ruler, had taken refuge in Egypt. He went to him, assisted in raising a force of 500 men, marched 600 m. over the Libyan desert, secured the assistance of the American fleet, and captured Derne after a furious assault, in which he was wounded. The reigning bey came against him, and desultory warfare followed. June 11, 1805, a general engagement took place, and the usurping bey was defeated. Eaton was about to march to Tripoli, install the rightful ruler, and release a large number of American captives, when news arrived that peace with Tripoli had been concluded by the American consul at Algiers. This put an end to his work, and he returned home. He settled in Massachusetts; the legislature of that state gave him 10,000 acres of land. Later, he was himself elected to the legislature. In 1806, Aaron Burr tried to engage him in the south-western conspiracy, but without success, and on Burr's trial Eaton was a witness against him.

EAU CLAIRE, a co. in w. Wisconsin, on Chippewa and Eau Claire rivers, reached by the Chicago, St. Paul, and Minnesota, the Chippewa Falls and Western, and the West Wisconsin division of the Milwaukee and St. Paul railroad; 648 sq.m.; pop. '75, 15,991. The surface is uneven, and the soil fertile; principal productions, wheat, corn, oats, and butter. Co. seat, Eau Claire.

EAU CLAIRE, a city and seat of justice of Eau Claire co., Wis., at the junction of the Eau Claire and Chippewa rivers, and at the head of steam-boat navigation on the latter; on the West Wisconsin railroad, 88 m. from St. Paul; pop. '75, 8,440. With its suburbs of West and North Eau Claire, it is the chief commercial point in n.w. Wisconsin. It is the outlet of the Chippewa lumber district; has good water-power from both streams, with opportunities for the safe storage of large quantities of logs, and manufactures about 300,000,000 ft. of lumber annually.

EBAL AND GERIZIM. See GERIZIM and EBAL, *ante*.

E'BELING, CHRISTOPH DANIEL, 1741-1817; b. Hanover. He was famous for extensive knowledge of oriental languages, classic literature, and geography and history. The congress of the United States gave him a vote of thanks for his *History and Geography of North America*. He made a collection of about 4000 books and 10,000 maps relating to America, which is now in the library of Harvard university.

EBENEZER, the name of a place marked by a monumental stone set up by Samuel in recognition of divine assistance in a battle with the Philistines. Its location cannot be satisfactorily determined. The name means "Stone of the help."

EB'ERHARD, IM BART (Ger., with the beard), Count, and afterwards first duke of Württemberg; 1445-96; the second son of count Ludwig I. He succeeded his elder brother, Ludwig II., at the age of 12, and before he was 14 wrested the government from his uncle Ulrich, who had been appointed his guardian. His tutor was the learned John Nauclerus, but Eberhard profited little by his learning, indulged his passions, and led a dissipated life. In 1468, he made a pilgrimage to Jerusalem, after which he abandoned his reckless mode of living, and became one of the most popular princes of Germany. He married Barbara, daughter of Lodovico di Gonzaga, whose influence over him contributed largely to the elevation of his character. He began to study, gathering around him men of learning; and at the solicitation of his wife founded in 1477 the university of Tübingen. In 1482, Eberhard, by the treaty of Minzingen, put an end to the evils which had arisen from a division of the county made in 1437 between his father and his uncle Ulrich, as representatives of the two lines of Urach and Stuttgart. By this treaty he secured the future indivisibility of Württemberg and the right of primogeniture in his own family; he became at the same time the founder of the representative constitution of Württemberg. He made Stuttgart his place of residence, and improved the laws and condition of the convents in his country. Though a lover of peace, he knew how to bear the sword when war was necessary; and by his courage and fidelity to his engagements secured the esteem and friendship of the emperors Frederick III. and Maximilian I. In recognition of his services, the emperor at his first diet, held at Worms in 1495, raised Eberhard to the dignity of duke, confirming at the same time all the possessions and prerogatives of his house; but Eberhard did not long enjoy his new dignity. His two children died in infancy, and with his death the line of Urach became extinct.

EB'ERHARD, KONRAD, 1768-1859; b. Bavaria; studied in Munich and Rome; sculptor and painter; became professor of sculpture in the Munich academy of fine arts. Many of his paintings illustrate the progress and triumphs of Christianity. Of his sculptures, the best known are the statues of St. Michael and St. George at the Isargate, Munich; and the tomb of the princess Caroline.

EBERS, GEORG MORITZ, b. Berlin, 1837; studied at Gottingen and Berlin, and taught in the university of Jena. He has paid especial attention to Egyptian archaeology, and has published *The Egyptian King's Daughter*, a description of the subjugation of Egypt by the Persians, in the form of a historical novel; *Egypt and the Books of Moses; through Goshen to Sinai*; etc.

EB'OLI, ANNA DE MENDOZA, Princess of, daughter of a viceroy of Peru at the court of Philip II. of Spain in the 16th century. She was famous for her intrigues, fascinating the king, the secretary of foreign affairs, and other great men. She was charged with being implicated in the murder of Escobedo, the envoy of Don John of Austria.

EBULIOSCOPE, an instrument for ascertaining the strength of distilled liquors by observing the boiling point and the atmospheric pressure.

ÉCARTÉ, a game at cards, probably first played early in the present century in Paris, though it appears to have grown out of an old game called *la triomphe*, or French-ruff. It is usually played by two persons, though sometimes by three, the third player taking the place of the loser in the first game, and the pool not being taken except by the winner of two games in succession. In French écarté, bystanders are permitted to advise, and the player losing leaves the table, his adviser taking his place. If, however, the loser is playing *la chouette* (i.e., taking all bets offered), he need not retire on losing. The small cards are removed from a pack, and the player cutting highest deals. He

gives five cards, by two and three at a time, to his opponent and himself, and turns up the eleventh card for trumps. The trump card, if a king, counts one for the dealer. His adversary, if satisfied with his hand, plays; if not satisfied, proposes, and the dealer can accept or refuse. Should he accept, each may discard, face downward, as many cards as he may choose, receiving fresh ones from the cards yet undealt, these being given first to the non-dealer, till his hand is complete. A second proposal and a third may be made, and so on till the player is satisfied; but if the dealer refuse, the hand must be played without discarding. The king of trumps scores one if in either hand. The non-dealer being satisfied with his hand, leads; the dealer follows; and the trick is taken by the highest card, or the trump. The king is the highest. The winner of a trick leads to the next. The second player must follow suit, and must win the trick if he can. The game is scored by the king, as explained, and the majority of tricks. Three tricks score one for the point; all five tricks won by one player score two for the *vole*. When the non-dealer does not propose, or his proposal is refused, and he fails to gain three tricks, the dealer scores two, but no more even though he win the *vole*. The game is five up.

ECCALEOBION, an oven for hatching eggs. The eggs are placed on shelves one above the other, so fixed that the eggs can be turned over once in a day or two. The proper temperature is provided by steam or warm water. Artificial hatching was one of the most ancient inventions of Egypt. Perhaps the idea was taken from the hatching of eggs in the hot sand of that country.

ECCARD, JOHANNES, 1553-1611; b. Prussia; a composer of church music. He was a pupil of Orlando Lasso, at Munich. In 1583, he became assistant conductor, and in 1595, chapel-master, at Königsberg. In 1608, he was chief conductor of the elector's chapel in Berlin, where he died. His works are songs, sacred cantatas, and chorales. He set to music the great national hymn of the Germans, *A Mighty Fortress is our God*, (Luther's *Ein feste Burg ist unser Gott*). Many collections of his songs are extant.

ECHELLENSIS, or **ECHELLENSIS**, ABRAHAM, b. Syria, near the close of the 16th c.; educated in the Maronite college in Rome, and professor of Arabic and Syriac in the college of the Propagandists. In Paris, he assisted in the preparation of Le Jay's Polyglot Bible. He published several Latin translations of Arabic works, and was engaged in a controversy with Selden as to the historical grounds of episcopacy.

ECCLESIA. I. The great assembly of the Athenians in which all free citizens might vote. Its authority was supreme, but, as in the growing power of the higher classes it was after a time seldom convened, the entire management of the state fell into the hands of the archons, who were chosen from the aristocratic classes. Solon (B.C. 594) ordained that it should meet monthly, on established days, and at other times when emergencies arose. It was convened by the *prytanes*, was presided over by the *epistates*, and, after it had been constituted by the offering of sacrifice and prayer, the *proedroi* announced the subjects for consideration, which had already been acted on by the senate, but required the consent of the people before they could become laws. Citizens who were over 50 years of age were first invited to speak; afterwards any one over 30 might be heard. The voting was by stretching forth the hands, or by depositing beans and stones in vessels prepared for them. When the business had been finished the *prytanes* dismissed the *E*. In Sparta, also, there were assemblies of the same name. One kind, composed only of citizens of Sparta itself, was called the little *E*. It met once a month, at first in the open air and afterwards in a building erected for the purpose. Any citizen over 30 years of age might speak. Another kind, called by way of eminence the *E*, was composed of the kings, senators, magistrates, and delegates from all the towns and cities of the province of Laconia. It had cognizance of all affairs of common interest and importance to the whole state. The voting at Sparta was by acclamation, and not by ballot. The majority was determined by the comparative volume of sound, or, if that was doubted, by a division and counting of the two parties. II. In the Greek of the New Testament, *E* is the name for the company of Christ's disciples professing to trust in him as their Saviour and to obey him as their Lord. It is applied to a small assembly of them, such as were members of one family, or could meet in a dwelling-house of ordinary size; to the whole number in one city or neighborhood; to the whole number on earth; to all that are in heaven; and to the innumerable company on the earth and in the heavens.

ECCLESIASTES, **BOOK OF**, consists of an introduction, a main body, and a conclusion. The introduction announces the theme that all things beneath the sun, if pursued as in themselves the chief end of man, and without reference to God and to immortality, are utterly vain. Man in such a pursuit, with all his high faculties, has less value and power than pertain to unconscious nature, for while it abideth he is quickly cut off; natural objects depart and return, in endless circuit, but man's life comes to an end and he is no more. The main body of the book establishes this proposition not by abstract reasoning, but by appeal to the actual experience of the human heart; and not among the poor, lowly, and ignorant, but among the wise, exalted, and rich. At the head of this class, in a Jew's esteem, would be the kings in Jerusalem, and among them all Solomon was most exalted. He, therefore, is introduced as revealing the feelings of his heart in the midst of his wisdom, wealth, and power. He had tried

wisdom, pleasure, and every form of great achievement, and had found them vanity. Yet, by bringing God and the soul into the account, measures of happiness may be enjoyed. These the book proceeds to declare: 1. Happiness is attainable here in the enjoyment of the food which sustains life, and of labor as it is performed. But even this, man cannot secure by his own efforts alone. It must be the gift of God. He will bestow wisdom, knowledge, and joy on those who are good in his sight; but the activity and energy of sinners he will make advantageous to others rather than to themselves. 2. Riches, even when obtained through toil, cannot in themselves give happiness; for all enjoyment of the food which sustains life, and of the wealth which crowns it, is the gift of God, and from him must the rich obtain it, on the conditions which he prescribes, and in the measures which he bestows, or vanity and vexation will fill their souls. 3. As there are many circumstances of life in which wealth has no power to give happiness, as it is often lost after it has been acquired, and as many persons never possess it, happiness is to be found in the enjoyment of the food which sustains life, and in the possession of joy *in the soul*, independently of circumstances, whether of wealth or poverty, of success or failure, of obscurity or fame. This only can abide with man amidst all changes; and this, God who created the soul, and he only can supply. 4. Life, whatever its circumstances and experiences, comes to one inevitable end, in which all that is material shall return to the earth, and the spirit, the great gift of God, shall return to him. Preparation for this end, therefore, is the great object of life. If it be rightly made, life is a grand success, whatever its circumstances and transient experiences may be; if it be not made, life is an awful failure, whatever honor, wealth, or pleasure may have been secured. While these four propositions, linked together, are the golden thread which runs through the book, many particulars, drawn from personal observation and experience, are grouped around them. Some of these may be readily comprehended by any thoughtful mind; others, many persons can scarcely, if at all, understand. But this difficulty shows that the book is true to life; for while much of human experience is common to all men, and may therefore be understood by all, in other parts of it each heart knows its own bitterness and a stranger does not intermeddle with its joy. Every human soul, in its progress from folly to wisdom, or on its way back from transgression to righteousness, passes through phases of inconsistency, darkness, doubt, mystery, and wickedness, which, if faithfully recorded, would be incomprehensible to other minds. It is possible that some of the confusion which many find in the details of Ecclesiastes, is of this sort. The conclusion of the book, repeating the declaration that human life, when pursued as if it contained within itself its highest end, is the vainest of vain things, adds a single rule for its guidance in all circumstances and in every age. The fear of God, securing obedience to his commandments in view of his appointed judgment to come, is all that is requisite to insure the righteousness, peace, and welfare of man.

Since the time of Luther, continental critics generally, including many who do not question the canonical authority of Ecclesiastes, have ascribed the authorship of it to some unknown writer who lived between B.C. 536 and 150, and, as they suppose, introduced Solomon as revealing his own experience and speaking as a representative of mankind. The reasons assigned for their opinion are: 1. That the book is written in Hebrew of a much later age than Solomon's, and contains many Aramaic words; 2. That many parts of the subject matter are not such as Solomon would have written. On the other hand, Jewish tradition from the earliest times has attributed the book to Solomon, saying that he wrote the song of songs in his youth, the proverbs in middle life, and Ecclesiastes in old age. Some modern scholars, whose thorough knowledge of Hebrew is unquestioned, stand resolutely by Jewish tradition; and some, who, perhaps, are not Hebrew scholars, are bold enough to say that since Solomon, in his later years, had constant conversation with foreign women, he may have corrupted his language with foreign words and idioms, so that the peculiarities of diction which are found in Ecclesiastes, instead of proving that he did not write the book, are only additional mementoes of the transgressions which had made so much of his life more bitter than death.

ECCLESIASTICAL HISTORY, in its widest range, is the history of religious organization among men, on the basis of divine revelation, from the creation to the end of the world. It is distinct from secular history; yet so inseparably connected with it, that one can never be fully understood without the other. Ecclesiastical history is divided into two great periods by the completion of the Scriptures as the inspired word of God. The first, extending from the creation to the end of the apostolic age, includes the days before the flood, the times of the patriarchs, of the exodus from Egypt, and the conquest of Canaan, of the kings and prophets, the captivity, restoration, and subjection to Roman rule; the mission of John the Baptist, the advent, life, and work of Christ, and the apostolic founding and extension of the church. At the close of the apostolic age, ecclesiastical history, in its more restricted range, begins. It may be assigned in three great divisions:

I. ANCIENT CHRISTIANITY, from the death of the apostle John to Charlemagne, A.D. 100-800.

1. *The age of persecution*; to the accession of Constantine, 100-325. The principal part of the "ten" persecutions; testimony of the martyrs, confessors, and argumentative defenders of Christianity; beginning of monasticism; rise and progress of the hierarchy; extension of Christianity throughout the empire and beyond its bounds.

2. *The imperial age*; Constantine to Gregory I., 325-590. Influence of Christian emperors within the church; complete establishment of the hierarchy; Arian and Pelagian controversies; fall of paganism; missionary work of Patrick and Columba in the British isles; five general councils, Nicea, 1st Constantinople, Ephesus, Chalcedon, 2d Constantinople.

3. *The age of Christian nationality* in Europe; Gregory I. to Charlemagne, 590-800. Evangelical British missions in France and Germany; Britain reappears as England, "*Angli or angeli*;" rise of Mohammed; the Saracens overrun Asia, Africa, and Spain, but are defeated in the west by Charles Martel; controversy and commotion concerning image worship and image breaking; temporal power of the pope granted by Pepin and confirmed by Charlemagne; Charlemagne crowned emperor by the pope.

II. MEDIÆVAL CHRISTIANITY, Charlemagne to Luther, 800-1517.

1. *Continued progress of Christianity*; Charlemagne to Hildebrand, 800-1049. Extension of the Latin church in the west and of the Greek in the north-east; progress of the papacy; rise of scholasticism.

2. *Supremacy of the papacy*; from Gregory VII. to Boniface VIII., 1073-1294. Contest between the pope and the emperor; celibacy of the clergy enjoined; the crusades; culmination of scholasticism; mysticism.

3. *Decline of the papacy*; Boniface VIII. to Luther, 1294-1517. The Scriptures forbidden to the laity; the inquisition founded; persecution of the Albigenses; transubstantiation and auricular confession established; reformatory councils of Pisa, Constance, and Basle; heralds of the reformation—Wycliffe in England, Huss in Bohemia, Wessel in Holland, Savonarola in Italy; capture of Constantinople; revival of letters; invention of printing; maritime adventure; discovery of America.

III. MODERN CHRISTIANITY; Luther to the present time, 1517-1880.

1. *Age of Protestant reform and papal reaction*; Luther to peace of Westphalia, 1517-1648. Protestant churches in Germany, France, Switzerland, England, Scotland, America; Puritans, Jesuits, Jansenists; massacre of St. Bartholomew; Protestants banished from Bohemia; thirty years' war; treaty of Westphalia promising religious toleration.

2. *Age of struggle for religious liberty*; peace of Westphalia to the French and English wars in America, 1648-1750. Flight of Huguenots from France; non-conformists driven from their livings in England; growth of Greek church in Russia; increase of Protestantism in American colonies.

3. *Age of revolution, conflict, and progress*; 1750-1880. American independence, with separation of church and state; French revolution from absolute monarchy through democracy and imperialism to a republic; general uprising of the people, and advance in civil and religious liberty; growth of the United States, war of the rebellion, abolition of slavery, revival of evangelical religion; conflict of Christianity with various forms of irreligion and secularism—English deism, French infidelity, German rationalism, materialism; free church of Scotland; disestablished churches in Ireland; growth of ritualism; papal infallibility declared; bible societies, steam navigation, railroads, telegraphs, journalism; improvement of common schools, colleges, technical schools; extension of Christianity over the world.

The sources of ecclesiastical history are, first, *the written*; comprising acts of councils, creeds, liturgies, hymns, church laws, papal bulls, and encyclical letters, writings of the fathers, schoolmen, reformers, and anti-reformers; second, *the monumental*, including crosses, crucifixes, pictures, vestments, furniture, coins, churches, chapels; some of this class are partly written, as inscriptions on walls, pictures, tablets, and tombs. He who is thoroughly familiar with the imagery of the catacombs will sympathize more fully with the heart of the early church, during the period of persecution, than he would be able to do after the profoundest study of books alone. The basilicas, modeled after the grand secular edifices of Greece and Rome, illustrate the external enthronement of Christianity; the Byzantine churches record the splendor of the imperial age; the Gothic cathedrals are trophies of mediæval glory; those of the renaissance are memorials of the attempt to make pagan culture live again in Christian times. The ecclesiastical historian, besides general intelligence, culture, and learning, should possess the critical and judicial faculty, that he may discriminate between conflicting testimonies, and may interpret correctly the witness which he accepts. He should have an insight into speculative thought, metaphysical distinctions and ethical ideas; should be acquainted with human nature, scientifically and practically; should be in sympathy with the spirit of Christ, as exhibited in the New Testament, and have, in his inmost being, an experience of spiritual truth. His style, in addition to all other attainable good qualities, should present a brilliant panorama rather than a lifeless schedule; should acquire a majesty worthy of the movement of the divine idea through the ages which he unfolds; and should throb with human sympathy as he narrates the endless story of sorrow and joy, fear and hope, spiritual death, and spiritual life.

ECCLESIASTICUS, Book or (*ante*), the longest and one of the best books of the Apocrypha. Affixed to it are two prologues: the first, by an unknown author, states that the Jesus, son of Sirach, whose name is at the head of the book, lived in the latter times, after the people had returned home from the captivity; that his grandfather Jesus, a man of great diligence and wisdom among the Hebrews, having gathered the instructive and

short sentences of the wise men who preceded him, and having himself uttered some full of wisdom and understanding, died, leaving the book almost finished; and that his son Sirach left it to his son Jesus, who set it in order and finished it, calling it *Wisdom*: the second prologue is by this Jesus son of Sirach, giving a similar account of the author, and adding concerning himself that he had thought it incumbent on him to translate and finish the book. The translation was made from the Hebrew, as this second prologue affirms; and Jerome testifies that he had seen a copy of the book in that language. Chap. I. contains a glowing eulogium on Simon the high-priest which implies that it was written after his death. And although there were two high-priests of that name, the grandeur of the description is appropriate only to the first, who died about 300 B.C. How long after that date the book was written, is not known. It was translated during the reign of Euergetes. But as two of the Ptolemies were well known by that surname, the precise date is not determined. The book, regarded by critics as almost incapable of analysis, because of the derangement and corruption of the text, may be summarized as to its teachings on important points. I. *Its main object*—as set forth by the name which the translator gave it—is to describe the true nature of *wisdom*, to exhibit its importance in all the employments and relations of life, and to exhort all men to seek it diligently. It is declared to come from God as its author, and to be in his Word as its fountain. It is the gift of God to those who love him, fear him, and do his commandments. In many respects the ideal of wisdom which the book presents is elevated and good, and its ideal of morality and piety is creditable, if judged by the standard of the time when it was written. Yet the wisdom scarcely equals that of the proverbs or of Job; and the morality falls short of the holiness which the Scriptures exhibit and enforce. II. *The character which it ascribes to God*. It declares him to be in his being from everlasting to everlasting, the creator of all things, greater than his most glorious works, infinite, almighty, omniscient, righteous, holy, greatly to be feared, compassionate, long-suffering, merciful, forgiving. III. *Its view of God's providential government*. It affirms that, sitting on his throne, he governs the world with the palm of his hand, and marking, with eyes ten thousand times brighter than the sun, the ways of men; humbling and exalting them according to his pleasure and their deserts; plucking up the proud nations and planting the lowly in their place; hating sin, visiting vengeance on the ungodly, and reserving them for the day of their punishment; regarding the prayer of the poor, and inflicting swift judgment on their oppressors; sending his blessing on children who honor their father, and his curse on those who provoke their mother; watching over them that love him as their mighty protector and strong stay. IV. *Does it teach anything concerning a future life?* Its general scope has regard to this life only. The advantages of wisdom and piety, of prayer, of morality and righteousness, are set forth constantly and in positive terms as bearing on this world, on youth, manhood, old age, and long life. The virtue and piety of fathers will make an honorable memorial for themselves, and will be beneficial to their children after them. But scarcely is there any reference to anything beyond death and the grave. There are few allusions, even, to the question whether there be a future life or not. Such passages as these exhibit the general view—"All things cannot be in men, because the son of man is not immortal." "The number of man's days at the most is 100 years; as a drop of water to the sea and a gravel stone to the sand, so are 1000 years to eternity." "Weep for the dead, for he hath lost the light; make little weeping for the dead, for he is at rest." "There is no inquisition in the grave, whether thou have lived 10 or 100 or 1000 years." Yet there are some exceptions which must be taken into the account in judging the book. Once it is said, "They that do the things which please the Lord shall receive the fruit of the tree of immortality." And once, "At the end of the way of sinners is the pit of hades." And when the historical characters of the Old Testament are reviewed and praised, it is said of Enoch, that "he pleased the Lord and was translated;" of Elias, that "he was taken up in a whirlwind and in a chariot of fiery horses;" and of Samuel, that "after his death he prophesied and showed the king his end." V. *Does it teach anything concerning atonement for sin and the promised Savior by whom the atonement was to be made?* It says of forgiveness, as the Lord Jesus afterwards taught, "Forgive thy neighbor the hurt that he hath done unto thee, so shall thy sins also be forgiven when thou prayest." Of atonement it says, as the Lord Jesus did not teach, "Whoso honoreth his father maketh atonement for his sins." "In the day of thy affliction the relieving of thy father shall be remembered, thy sins also shall melt away as ice in warm weather." It recognizes Aaron's consecration as a high-priest "to make reconciliation for his people," but gives no assurance of faith in a greater high-priest to come. It commends Isaiah as a great and faithful prophet, "comforting those that mourn in Zion, and showing what should come to pass forever;" but gives no intimation that among those future events there was the coming of a Savior to die for sinners and to make intercession for them. It quotes from Malachi the future mission of Elias, "to turn the heart of the fathers to the children;" but says nothing about the coming of the Lord to his temple. Yet it does say that "the Lord gave a remnant to Jacob, and out of him a root unto David." It does say, "I will thank thee, O Lord my king, and praise thee, O God my Savior." And it contains the remarkable record, "*I called upon the Lord, the Father of my Lord*," which, without attempting an interpretation of it, we may group with David's declaration, "The Lord said unto my Lord," and Paul's dox-

ology, "Blessed be the God and Father of our Lord Jesus Christ." VI. *Its testimony to the historical character of the Old Testament Scriptures.* That the writer was familiar with the Old Testament, containing, substantially, the same books and the same things that it contains now, is manifest from his references to nearly all the prominent personages and principal scenes of its long history, from Adam to Zerubbabel. Yet two surprising omissions must be noted; there is no mention of Ezra by the side of Nehemiah, and no reference to Daniel.

ÉCHEVIN, an officer in France of a rank existing from the days of Charlemagne to the revolution of 1789. His general functions were financial. In Paris, the échevins were assessors; and in some cases they had the authority of local magistrates.

ECHINADES, islands in the Ionian sea, around the entrance to the gulf of Corinth. They were said to have been formed by drifts from the river Achelous. They are now called the Curzolari islands, and are of little importance. Homer says they were inhabited, but later authors report otherwise. There are at present a few small villages on them. The battle of Lepanto was fought off these islands, Oct. 7, 1571.

ECHINUS, a genus of the order *echinodermata*, known as sea-urchins, found along the American coast. The common echinus of the Atlantic coast is about an inch in diameter; but some kinds are three or four times as much. They have globe shaped cases, flat on the lower side, formed of calcareous plates, covered on the outside with movable spines from 1 to 5 in. long. With the aid of the spines and a great number of feet with suckers at the ends, the animal rolls slowly over the bottom, or clings to neighboring objects. They bore holes in the hardest rocks, where they make their homes, increasing the cavities as they grow, but not the opening, and so are often prisoners for life. Some species bury themselves in the sand near the water. In tropical climates some of the largest are used for food.

ECHMIEDZIN'. See ETCHMIADZIN.

ECHO, in Grecian mythology, one of the Oreades, or mountain nymphs. The name denotes sound in the abstract. Echo could not speak until spoken to—a punishment inflicted upon her by Juno, who was detained by Echo's talkativeness while Juno was hunting among the Oreades for her truant Jupiter. A further legend is that Echo fell in love with Narcissus; but as he did not respond, she wasted away with grief until nothing but her voice remained; whereupon Nemesis punished the fickle Narcissus by causing him to fall in love with himself.

ECHO CAÑON, a deep ravine in Utah, near the Union Pacific railroad; 975 m. w. of Omaha. The sides are of rock, bare, and almost vertical in position. The scenery is remarkably beautiful and sublime.

ECHOLS, a co. in s. Georgia, bordering on Florida, intersected by a branch of the Atlantic and Gulf railroad, and the Allapaha river; 400 sq. m.; pop. '70, 1978—465 colored. The surface is level and the soil sandy. Productions, corn, cotton, etc. Co. seat, Statenville.

ECKFORD, HENRY, b. Scotland, 1775; d. Constantinople, 1832. He was one of the earliest of the famous shipbuilders of New York. In 1812, during the war with England, he built a fleet of vessels for service on the lakes. He was the builder of the *Robert Fulton* which made the voyage by steam to Havana and New Orleans. In 1820, he was naval constructor at Brooklyn, and built six ships of the line. Afterwards he built many ships for foreign powers. In 1831, he built a man-of-war for Mahmoud, the sultan of Turkey, and visited that country to organize a navy-yard.

ECKHART, JOHANNES, generally called MEISTER (master) ECKHART, lived in the latter part of the 13th and beginning of the 14th c.; b. probably about 1250. He was of the Dominican order, and for some time professor in a college in Paris. Boniface VIII. called him to Rome to assist in the controversy between the pope and Philip of France. In 1304, he was provincial of his order for Saxony, and in 1307, vicar-general of Bohemia. He was distinguished for practical reforms, and for his power as a preacher. He systematized and expounded the fundamental notions of the Beghards (q. v.) and Brethren of the Free Spirit. The opponents of the Beghards found some propositions in Eckhart's works for which he was called to account by the inquisition at Cologne. He made a conditional recantation, and appealed to the pope, by whom some of his propositions were formally condemned. About the time of the issuing of this condemnation, Eckhart died. His works show that he was deeply learned in all the philosophy of the time, and one of the profoundest thinkers of all time. His style is without system, brief, mystical, and full of symbolical expressions; but his thinking was clear, calm, and logical; and he gave the most complete exposition of what may be called Christian pantheism. The starting point of his doctrine is that, apart from God, there is no real being. But, in his view, God is the unknown. He conceives of the Godhead, as without any thing that can be affirmed concerning it. Any thing definitely ascribed to it would limit and therefore destroy its infinity. The Godhead is not God as known to us. From it proceeds the triune God, who is known. The *essence* of the Godhead is what it is in itself; its *nature* is that which it becomes as an object for others. It reveals itself in the personal God, the Father. The Son is the word or expres-

sion through and in which the Father becomes self-conscious. The Father eternally begets the Son, and the Son's return into the Father in love and mutual will is the Spirit. The Father is not before the Son; only through the begetting of the Son, only through arriving at self-consciousness, does he become the Father. The genesis of the Son from the Father involves also the production of the world of things; for God is reason, and in reason is contained the ideal world of creatures. In the Son all things are made in ideal form. As all things have arisen from God, so they all tend to return to him. Repose in him is the end of all things; and in man, the noblest of creatures, this end is realized. In him, specially, there is the power of reaching to the absolute, the ground both of God and the universe. This power—which E. called *the spark*—is in truth God working in man. In cognition of God, God and man are one; there is no distinction of knower and known. Union with God—the birth of the Son in the soul—is the ultimate end of activity and is to be attained by resigning all individuality. When this is reached the soul is one with God; its will is God's; it cannot sin. Yet all this applies only to the "spark" in the soul, the other powers of which may be properly employed about other things. Thus, the way is left open to adjust the balance between feeling and action; between philosophical theory and practical life. In Eckhart's theories appear at least the elements of some modern metaphysical speculations.

ECLOGUE, usually designates a pastoral poem in which are related the loves and adventures of shepherds and shepherdesses in some ideal scene and period. The name is sometimes applied to Virgil's *Bucolics*. Spenser is perhaps the leading English poet in eclogues—a species of composition now out of date.

EDES'SA, formerly known as *Ægæ*, the ancient capital of Macedonia, 46 m. w. of Thessalonica, at the head of a defile commanding the approaches from the sea-coast to the interior. It was the original residence of the Macedonian kings, and was the burial-place of the royal family long after it ceased to be the seat of government. In Edessa Philip II. was murdered by Pausanias, 336 B.C. The greater Alexander was buried at Memphis, but Edessa remained the royal burial-place, and when Pyrrhus occupied the place, the royal tombs were plundered by his Gallic mercenaries. The modern city of Vodená is built on the site of Edessa, and some remains of the ancient buildings are preserved.

EDGAR, a co. in e. Illinois, on the Indiana border, drained by affluents of the Wabash, and intersected by the Indianapolis and St. Louis railroad; 580 sq.m.; pop. '70, 21,450. It has a level surface of prairie and timber land, and fertile soil. The chief productions are corn, wheat, oats, butter, and wool. Co. seat, Paris.

EDGARTOWN, a village and port of entry in Dukes co., Mass., 75 m. s.e. of Boston; pop. '70, 1516. The port is on the e. side of the island, and has a well-sheltered harbor. There is daily communication with the mainland at Falmouth. Near Edgartown is a grove which has become famous for Methodist camp-meetings, at which sometimes as many as 20,000 people attend. Navigation and fishing are the principal occupations.

EDGEcombe, a co. in n.e. North Carolina, on Tar river, intersected by a branch of the Wilmington and Weldon railroad; 600 sq.m.; pop. '70, 22,970—15,112 colored. The surface is generally level, and the soil light and sandy. The chief productions are corn, cotton, and turpentine. Co. seat, Tarboro.

EDGEFIELD, a co. in w. South Carolina, on the Savannah river, by which it is separated from Georgia, traversed by the South Carolina, the Charlotte, Columbia and Augusta, and the Greenville and Augusta railroads; 1150 sq.m.; pop. '70, 42,486—25,417 colored. The surface is hilly, and the soil moderately fertile, producing corn, cotton, etc. There is abundant water-power, and a number of mills and factories. Co. seat, Edgefield Court House.

EDGEWORTH, RICHARD LOVELL, 1744-1817; b. Bath, England; the father of the celebrated authoress Maria Edgeworth, and associated with her in literary labors. He was an intimate friend of Dr. Erasmus Darwin. Among his writings are *Professional Education*; *Practical Education*; *Essay on Irish Bulls*; and autobiographical memoirs.

EDINBURGH, ALFRED ERNEST ALBERT, Duke of, commonly known as prince Alfred; third child and second son of Victoria, queen of Great Britain; b. Aug. 6, 1844. He is also a duke of Saxony, and prince of Saxe-Coburg Gotha. He was educated by special tutors, and at the age of 14 went into the royal navy, serving chiefly in foreign stations. The crown of Greece was offered to him in 1862, but he declined it. In 1866, he took his place in the house of lords; in 1867, he commanded the frigate *Galatea* on a voyage to Australia and India. He attended a picnic in New South Wales, where an Irishman fired at and slightly wounded him. The duke married at St. Petersburg, Jan. 21, 1874, Marie Alexandrowna, grand duchess of Russia. They have four children, a son and three daughters.

EDISON, THOMAS ALVA, b. Ohio, 1847, of a mother of Scotch and a father of Dutch descent. The boy had scarcely eight weeks of common school education, but he had a passion for reading, and his education was greatly advanced by the assiduous care of his mother, who, however, died when he was but 15 years old. Before he was 12 he had read Hume and Gibbon, and all that he could get of the *Penny Cyclopædia*. He had

a liking for chemistry, and such a thirst for all kinds of knowledge, that he firmly resolved to read every important book in the Detroit public library. With this design he went through Newton's *Principia*, Ure's *Dictionary of Science*, and by way of dessert, Burton's *Anatomy of Melancholy*. Becoming a newsboy on the trains of the Grand Trunk railroad, his employment introduced him to a more varied range of books. The infection of chemistry clung to him, and was developed by his establishing a laboratory in an empty car. But his chemicals exploded, set the car on fire, and put the train in great danger. The boy and his broken apparatus were promptly thrown out of the car by the indignant conductor. The next venture of the young enthusiast was in getting a small lot of type, and issuing on the train a small sheet called *The Grand Trunk Herald*. Becoming acquainted with telegraph operators, he determined to learn the art himself. A kind-hearted station-master consented to give him lessons, and for several months Edison returned to that station after a long day's work, and took his regular lessons at night. He became an expert operator, and was employed at Port Huron, Mich., Stratford, Canada, and Adrian, Mich, where he also prepared a small workshop and began to repair telegraph instruments and manufacture other novel machinery. From this place he went to Indianapolis, where he invented his automatic repeater, an instrument by which messages are transferred from one wire to another without the aid of an operator. He wandered to Cincinnati, Louisville, Memphis, and New Orleans, returned to Cincinnati, and at the age of 20 began to be known as a successful inventor. But he was called to Boston on telegraph business, having become famous as one of the most expert of operators, and there he set up a shop for his experiments. Testing, in 1870, between Rochester, N. Y., and Boston, his new invention of duplex telegraphing, he was not successful; but he was employed by the gold indicator company in New York, of which he became superintendent. While in this position he brought out some new inventions, and introduced improved apparatus. At the same time he set up a factory in Newark, N. J., for making his novel apparatus and machines. Here he employed 300 persons; but the superintendence took so much of his time that he gave it up, and, in 1876, set up a small experimenting establishment at Menlo Park, on the Pennsylvania railroad, 24 m. from New York. This establishment has grown to be almost a village in itself, and since the commencement of 1879, has been the Mecca of all men interested in the perfection of artificial lighting by electricity. At the time of this writing (Aug., 1880), he has made no public demonstration, but one is promised ere long, and then he confidently expects to give the world a safe, cheap, and reliable electric carbon light that will take the place of nearly all the illuminating materials now in use. The number of inventions, great and small, already patented by Edison, is said to be nearly 200. The most important are the carbon telephone, the phonograph, the micro-tasimeter, the aërophone, the megaphone, the phonometer, the electric pen, and especially the quadruplex system of telegraphing, by means of which four messages at the same time may be sent in opposite directions over a single wire, and perfectly delivered.

EDISTO ISLAND, one of the "sea islands" so famous for long-staple cotton, on the South Carolina coast, between North and South Edisto inlets; pop. '70, 2,762—2,634 colored.

EDMONDS, JOHN WORTH, b. N. Y.; 1799-1874; a graduate of Union college, admitted to the bar in 1819, and practiced law in his native city (Hudson). In 1831, he was a member of the state assembly, and of the senate (then the court of errors) from 1832 to 1835. In 1837, he removed to New York city; in 1845, he was appointed one of the circuit judges; in 1847, judge of the supreme court, and in 1852, one of the judges of appeals. About 1851, he became convinced of the truth of spiritual manifestations, and in 1853 publicly declared his faith—preparing and publishing a work entitled *Spiritualism*. He became a leading champion of the doctrines, and his well-known ability as a jurist was of great advantage to the unpopular innovation. He was himself a "medium," and was convinced that he was frequently in communication with the spirits of the departed. No doubt this attachment to spiritualism had great influence in bringing about his retirement from the bench; but no one supposed that his faculties or his honesty as a jurist were in the least influenced by his peculiar belief; nor does any one doubt that he just as honestly believed in the reality of his spiritual impressions as he did in the reality of the civil code or of Blackstone's commentaries. He also published important law reports.

EDMONDSON, a co. in central Kentucky, watered by Green river, crossed by the Louisville and Nashville railroad; 225 sq. m.; pop. '70, 4,459—226 colored. The surface is uneven; soil tolerably fertile; coal is abundant. The chief productions are corn and tobacco. The great attraction of the co. is the famous Mammoth cave. Co. seat, Brownsville.

EDMUND I., or EADMUND I. (ATHELING), 922-46; son of Edward the elder, grandson of Alfred the great, and king of the Mercians and West Saxons, succeeded Athelstan (his brother) in 941, at the age of 18. He had shown remarkable bravery three years before in the battle with the Danes at Brunanburg. At the time of his succession the Northumbrians brought over from Ireland Anlaf, a Danish king of Dublin;

the Danes joined them, and Edmund was compelled to make a large cession of territory. After the death of Anlaf, Edmund freed his own kingdom, subdued the Britons of Cumberland, and gave their territory to Malcolm of Scotland to secure his co-operation in military service. Edmund was assassinated by an outlaw May 26, 946, while at a banquet.

EDMUND, SAINT (EDMUND RICH), 1190-1240; b. Abingdon, England; the son of a mother whose piety amounted to ascetic fanaticism, and from whom he learned to become a self-tormentor. He got a tolerable education at Oxford, where he became a teacher in the university. His tendency of mind was to theology, so he became a priest, and was the first Englishman to receive the title of doctor of divinity. In 1227, he was one of the preachers of the sixth crusade. In 1234, he was consecrated archbishop of Canterbury. In 1236, he married king Henry III. to Eleanor, daughter of the count of Provence; but he was soon at enmity with the king, who induced the pope to send to England a legate who should have authority above that of Edmund. The latter was now in disfavor with both king and pope, and made a journey to Rome to effect a reconciliation; but he was insulted by the pope, and returned to England broken in spirit and resources. In 1240, he went to Pontigny, France, where the queen of France and her sons came to receive his blessing. To find improvement in health, he went to Soissy, where he died. His tomb became immediately famous for miracles, and six years after his death, the man who had always protested against the robbery of the people by the church was proclaimed a saint by the act of canonization.

EDMUNDS, a co. in central Dakota, formed after the census of 1870. It is in part occupied by the Plateau du Coutcau du Missouri.

EDMUNDS, GEORGE F., b. Vt., 1828. Besides a common school education he had the advantage of a private tutor; studied law at an early age, and was admitted to the bar in 1849. He settled in Burlington in 1851, and in 1854, and successively for four years, he was chosen to the popular branch of the state legislature, for three of the five years being speaker of the house. In 1861-62, he served in the senate, where he was speaker *pro tem*. When the rebellion broke out he was a member of the state convention which met to form a coalition between the republicans and the war democrats, and he drew up the resolutions adopted by that convention as the basis of union. At the death of Solomon Foot, Edmunds was appointed to fill the vacancy from Vermont in the U. S. senate, and taking his seat, April, 1866, has been regularly re-elected ever since. In the federal senate he has served on the committees on commerce, public lands, pensions, retrenchment, the judiciary, etc. He was a delegate to the Philadelphia "loyalists'" convention in 1866. He has been for several years at the head of the judiciary committee of the U. S. senate. During the spring of 1880, his name was freely mentioned for the republican presidential nomination.

EDRED, d. 955; king of the Anglo-Saxons, son of Edward the elder, and successor to Edmund I. He was victorious over the invading Danes in Northumbria. His nephew Edwy was his successor.

EDUCATION, COMMISSIONER OF, the chief officer of the bureau of education, at Washington. He is appointed by the president and senate, and his duties are "to collect such statistics and facts as shall show the condition and progress of education in the several states and territories;" to diffuse such "information respecting the organization and management of schools and school systems and methods of teaching as shall aid the people in the maintenance of efficient school systems, and otherwise promote the cause of education;" and also "to present annually to congress a report embodying the result of his investigations and labors, together with a statement of such facts and recommendations as will, in his judgment, subserve the purpose for which the department is established."

EDWARD, or EADWARD, I. (THE ELDER), d. 925; king of the Anglo-Saxons, eldest son of Alfred, succeeded his father in Oct., 901, when about 30 years of age, having previously distinguished himself by defeating the Danes. His cousin Ethelwald, who disputed Edward's right of succession, and endeavored to obtain the throne, was killed in battle. The reign of Edward was turbulent, but at length he thoroughly subdued the Danes, those of Northumbria, as well as the Scots, and the Welsh accepting him as their "father and lord." He carried the Anglo-Saxon rule to a power before unknown.

EDWARD, or EADWARD, II. (THE MARTYR), d. 978; king of the Anglo-Saxons, succeeded his father Edgar in 975 A.D., at the age of 13. His succession was contested in behalf of his younger brother, only 7 years old; but the powerful influence of St. Dunstan secured Edward's triumph. He died by treachery. Returning exhausted from the chase he was lured to the residence of Elfrida (the mother of the contesting prince) and there stabbed in the back.

EDWARD, the BLACK PRINCE (EDWARD III., ante), 1330-76; son of Edward III. of England, and Philippa. He was created duke of Cornwall in his eighth year, and a year later, during his father's absence in France, was appointed nominal guardian of the kingdom. He held this office also in 1340 and 1342; and was created prince of Wales

on the king's return in 1343. Three years later he accompanied his father to France, and in the battle of Crécy led the most victorious division of the army. He also shared his father's glory in the victory over the Spanish fleet at the battle of L'Espagnols-sur-Mer. In 1355, he was given command of the chief army in the French war, landed at Bordeaux, and after several smaller successes, in 1356 he gained the victory of Poitiers, capturing the French king, whom he carried captive to London in 1357. In 1361, during the short peace following king John's ransom, he married his cousin Joanna, the "fair maid of Kent," of whom he was the third husband, and being created duke of Aquitaine, crossed over to his new dukedom, where he ruled successfully and peacefully for a time. Making an entangling alliance with Pedro, the deposed king of Castile and Leon, although victorious he found himself burdened with the expenses and losses of a profitless war, and for the excessive taxes laid upon his duchy he was summoned to account at Paris. To this summons he replied haughtily that he would come "helm on head, and with 60,000 men." This led to a rupture between France and England. The French planned a double invasion of English territory. The duke of Anjou, commanding one expedition, besieged Limoges, which had been ceded to the English by the treaty of Bretigny and formed part of the principality of Aquitaine. The city surrendered by the treachery of its bishop. The black prince, enraged by this act, after a siege of a month, recaptured the city by assault, and put to the sword 3,000 of its inhabitants. This madness of cruelty is the chief blot on the fame of the prince. It is only partially explained by his disordered health, which itself was perhaps due to the irritation of seeing the English power waning in France, in spite of all his victories. He was compelled, by the advice of his physicians, to return to England the following year, 1371, where he lingered in continually failing health for five years. In these years he saw the loss of Aquitaine to England, but he did good service to the country in opposing the corrupt and oppressive influences which surrounded the king, and by his help parliament was able to pass acts against the king's mistress, Alice Ferrers, and in restraint of the dangerous ambition of John duke of Lancaster. These patriotic services endeared him to the people, and before his death he had regained the popularity of his earlier years. His mailed effigy marks the place of his burial in Canterbury cathedral.

EDWARDES, SIR HERBERT BENJAMIN, 1819-68; b. England; early in army service as a cadet in India; in 1841, ensign of the 1st Bengal fusiliers, with which regiment he remained five years, improving himself especially in the native languages. In the Sikh war he was aid to viscount Gough, the English commander-in-chief. After the war he continued in responsible positions in the civil service, but was soon again on military duty, doing service so brave and important as to receive the thanks of parliament. He was commissioner of the Peshawur frontier at the time of the Sepoy rebellion, and raised and sent a large force to aid in the siege of Delhi. For his many services he received the successive decorations of C.B., K.C.B., and K.C. of the star of India. He received the degree of LL.D. from the university of Cambridge. He published *A Year on the Punjab Frontier* in 1848-49.

EDWARDS, a co. in s.e. Illinois, bounded on the s.e. by the Little Wabash, reached by a branch of the Louisville, New Albany and St. Louis railroad; 200 sq.m.; pop. '70, 7,565. The surface is forest and prairie, producing wheat, corn, wool, tobacco, etc. Co. seat, Albion.

EDWARDS, a co. in s.w. Texas, in a rough region; 1225 sq.m.; entirely unsettled in 1870.

EDWARDS, BELA BATES, D.D., 1802-52; b. Mass.; graduated at Amherst, and studied theology at Andover theological seminary. In 1828, he was secretary of the American education society, and from 1828 to 1842, the editor of the organ of that society, the *American Quarterly Register*. In 1833, he started the *American Quarterly Observer*, which was soon united with the *Biblical Repository*, Dr. Edwards continuing as editor. From 1844 to 1852, he was editor of the *Bibliotheca Sacra*. In 1837, he was professor of Hebrew at Andover, and in 1848, of biblical literature. Among his works are the *Eclectic Reader*; *Biographies of Self-taught Men*; the *Missionary Gazetteer*; sermons, addresses, etc. In 1853, selections from his sermons, etc., were published with a memoir by prof. Edwards A. Park, who had long been his intimate friend and associate in literary and theological labors. In Edwards there was a rare combination of exact scholarship and critical thought, with a wide range of sympathy, both intellectual and moral, while his character was lovely with the modesty and gentleness which belong to the highest strength. These characteristics showed themselves in his English style, which was singularly pure, elegant, and vigorous.

EDWARDS, BRYAN, 1743-1800; b. England; when a boy he went to Jamaica, where the generosity of his uncle enabled him to finish his education. When his uncle died he inherited his vast estate. He was a member of the colonial assembly, but is best known by his *History, Civil and Commercial, of the British Colonies in the West Indies*. He also published a *History of San Domingo*, just after the great massacre. In 1796, he returned to England, and became a member of parliament, holding the place until his death.

EDWARDS, GEORGE, 1693-1773; b. England. He traveled in northern Europe studying natural history, and published *History of Birds*, in 4 vols., at intervals of sev-

eral years; and *Gleanings of Natural History*. He was a member of nearly all the leading scientific societies.

EDWARDS, JONATHAN (*ante*), in all accounts given concerning him, is sufficiently celebrated as a severe reasoner and profound writer on metaphysical themes. But they who would understand the influence which he has already exerted, and estimate rightly that which he will continue to exert, must not neglect other points of his nature and work. 1. His humility, modesty, and serenity of spirit endeared him to his friends and made him appear amiable to all who conversed with him. As a Christian he was an example of rational virtue and religion. In him men saw a rare assemblage of spiritual graces united with the richest mental gifts. He read all useful books that he could procure, especially those on theological subjects, examining both sides of a question, studying views which to him were erroneous, and investigating the arguments of extreme infidelity. But the Bible he studied more than all other books. His intimate acquaintance with it is conspicuous in all his writings. Few men were less under the bias of education or of bigotry. He exerted all his powers to find out truth, searching for it as for hid treasure. Every valuable thought he pursued at once as far as he then could. He read pen in hand, not so much to take notes of other men's thoughts as to secure his own. His scholarship was remarkable for the day in which he lived and the opportunities which he enjoyed. Born in an obscure village of a new and thinly settled colony, with the forests around him, and separated by 3,000 m. of ocean from the seats of art, refinement, and knowledge; educated at a college (only three years older than himself) that offered advantages less than academies now supply, he passed all the rest of his years amidst the cares of a laborious profession, on the very frontiers (and some of those years in the heart) of savage life. Yet, with all these hindrances, he was a proficient in classic and Hebrew literature, physics, mathematics, history, chronology, mental philosophy, and ethics. His greatest work was written in four and a half months, during which he carried on the correspondence of the mission and preached, each Sabbath, two sermons in English, and two by interpreters to two Indian congregations, besides catechising the children of both tribes. His neglect of style as a writer is to be regretted. His works were printed very much as first written. Yet a marked improvement was effected in his later years. The style of the *Inquiry Concerning the Freedom of the Will* (written, as has just been said, in so short a time) is considered by competent judges to be as correct as that of most metaphysical treatises. 2. In the early part of his life he acquired a very high character as a minister and preacher. Most of his hearers felt and acknowledged his power. Long before the publication of his writings, his fame as a preacher had spread through the colonies and into Great Britain. To eloquence, as many use the word, he had indeed no claim. He exhibited no studied varieties of voice, no strong emphasis, no graceful gesticulation, no attempt at elegance of style or beauty of illustration. But if eloquence be the power of presenting important truth to an audience with overwhelming weight of argument, and with the whole soul of the speaker thrown into every part of the conception and of the delivery, so that the attention of all is riveted until the end, and impressions are made which cannot be effaced, then Jonathan Edwards has been justly pronounced one of the most eloquent preachers of his own or of any age. His solemn consciousness of the presence of God controlled his preparations, was manifest in his services, and had an irresistible effect on his congregations. His knowledge of the human heart, springing from knowledge of the word of God, skill in mental philosophy, and his own personal experience, enabled him to speak to the consciousness of his hearers. His theological learning was so complete, and his general information so extensive, that he could impart variety and richness of thought to his sermons, and bring illustrations to bear on every point. From first to last his aim was simply the salvation of his hearers and the glory of God. In the introduction to his sermon he explained the passage from which he was to preach, and with great skill presented its whole drift in all its bearings. In the body of the sermon he did not attempt an elaborate proof of his doctrine, but rather placed it before his hearers as a fact, and painted it to their imagination. He laid out his strength in the application, speaking to the consciences of his hearers, applying to different characters the important ideas of the sermon, and closing with a solemn and earnest appeal to every feeling and principle of human nature. He counseled, exhorted, warned, expostulated, as if he was determined not to stop without convincing and persuading every man. 3. While his visits among his flock were, in a great degree, restricted to the sick and afflicted, he was eminently faithful and successful in other departments of pastoral work, especially in extraordinary labors during "revivals" which sprang up under his ministry, and in conversing with those who sought spiritual counsel. His study was at times thronged with persons who came to lay open to him their minds and hearts. 4. His theological treatises, especially, have made him extensively known, and are the foundation on which his highest reputation will ultimately rest. (1) In these he is distinguished for scriptural views of divine truth, adducing many passages in illustration and proof, examining them critically, arranging them carefully, and drawing conclusions from them with fidelity and skill. He seldom introduces any hypothesis of his own, and betrays little confidence in his own reason unless it is supported by the oracles of God. (2) He presents no partial or contracted views; all are simple,

great, and sublime. His mind was too expanded to regard the minor distinctions of denominations and sects. He belonged to no church but the church of Christ, contented for nothing but the truth of God, and aimed supremely at holiness and salvation. His labors coincide so completely with those which the gospel prescribes, that no denomination can appropriate him exclusively to itself. His originality in argument is striking and continued. He never walks in a beaten path. His positions, arguments, and conclusions are his own; and he did much to render theology a *new* science. (3) In controversy he maintained an excellent spirit. His integrity and fairness were conspicuous. The idea of employing sophistry in his argument seems never to have occurred to him as a possible thing. He was kind and sincere; fair in stating the real point in debate; and candid towards his opponents. He carefully avoided personalities and the imputation of unworthy motives to those from whom he was compelled to differ. These excellences as a disputant appear the more remarkable when the circumstances in which he wrote, and the topics which he handled, are considered. The treatise on the affections was written in the heat of a violent controversy which divided and agitated the whole country. In his works on the will, original sin, and justification, he dealt with subjects which had aroused bitter opposition, and replied to persons who had boasted of their victories in vain-glorious and irritating terms. His book on qualifications for communion was composed in the midst of a furious parochial storm, which did not ruffle his temper, although it drove him from his parish and home. (4) While his manner was courteous and his temper undisturbed, his arguments were, for the most part, unanswerable. They derived their strength from the conclusiveness of his reasoning, the employment of different trains of proof, all converging to one result, the anticipation of objections which might be taken to his view, and the skill with which he brought the *reductio ad absurdum* to his aid. The most metaphysical of his writings—*On the Freedom of the Will*—has been described by high authority as “a book which never has been, and never will be, answered.” His most practical treatise—on *The Qualifications for Communion*—being an attack on a favorite scheme of lax religionists, aroused indignation all over the country. Yet after a disastrous controversy it has so changed the opinions and practice of the New England ministers and churches, that a mode of admission to church-membership or to a *quasi* membership, then almost universal, is now disused. (5) In all his writings, even the most metaphysical, he aimed at the most important practical results. In them all his immediate success was great, and by them his influence on doctrine and piety has been extended through Christian schools of theology, pulpits, churches, and homes. Some of the themes on which he has given light are the following: God’s end in creating this material and spiritual universe; the nature of his government over intelligent minds, and how it is consistent with their freedom; the nature of the virtue which they must possess in order to secure his approbation; the source, extent, and evidences of human depravity; the series of events by which redemption is effected; the qualifications for the church to which the redeemed belong; the grounds on which they are justified; the nature and evidences of the religion imparted to them by the spirit of grace; the distinguishing marks and effects of revivals of religion produced by the effusion of divine influence on men; the inducements to united and special prayer that such effusions may be abundantly enjoyed by the church of God. Why—it has often been asked—did such a man die at the age of 54 years, in the fullness of his powers, and just when he had been called from the wilderness to fill one of the highest stations in the land?

EDWARDS, PIERREPONT, 1750-1826; son of Jonathan, the theologian. He served in the revolutionary army; practiced law; and was a member of congress in 1787. He was U. S. district judge for Connecticut at the time of his death.

EDWARDS, TRYON, D.D., b. Conn., 1809; great-grandson of Jonathan, the theologian; graduated at Yale, studied theology at Princeton, and law in New York; settled in the ministry at Rochester, N. Y., in 1834, and afterwards at New London, Conn. Among his publications are *Christianity a Philosophy of Principles*; *Self-Cultivation*; etc. He has edited *Charity and its Fruits*; *Select Poetry for Children and Youth*; *Jewels for the Household*; *The World’s Laconics*; *Wonders of the World*; and many issues of the *Family Christian Almanac*.

EDWARDS, WILLIAM, 1770-1851; b. N. J.; grandson of Jonathan. He introduced valuable improvement in the manufacture of leather, whereby tanning was accomplished in a quarter of the usual time. To be in proximity to abundance of hemlock bark, he set up a model tannery in the Catskill mountain region. His many improvements greatly advanced the production of leather in this country.

EDWY, EADWIG, or EDWIN (THE FAIR), about 938-58; king of the Anglo-Saxons; eldest son of Edmund I. He succeeded his uncle Eldred in 955. Little is known of his short reign except that he was at enmity with Dunstan, who bitterly opposed his marrying Elgiva. Dunstan was banished from the kingdom, but not long afterwards was restored by the Mercians, who had revolted from Edwy, and proclaimed Edgar king.

EECKHOUT, GERBRAND VAN DEN, 1631-74; a painter, b. in Amsterdam; a pupil of Rembrandt, whose style he successfully imitated. As a portrait painter he had a

peculiarly superior talent for expressing character. Among his best compositions are "Christ in the Temple," and "Haman and Mordecai."

EELEE, or **ILI**, a river of central Asia, rising in China and running w. about 600 m. to lake Balkash. The valley of the Eelee is the usual route between Russia and China.

EELEE, or **GOOLDJA**, a city in the extreme w. of China, in central Asia, on the river of the same name, 43° 46' n., and 82° 30' e.; pop. said to be 80,000. It is an important commercial center, and was formerly the place to which Chinese criminals were banished.

EFFINGHAM, a co. in e. Georgia, separated from South Carolina by the Savannah river, and bounded w. by the Ogeechee; crossed by the Georgia Central railroad; 480 sq. m.; pop. '70, 4,214—1704 colored. The surface is level, and mostly covered with forests; soil sand and poor; productions, corn, cotton, and rice. Co. seat, Springfield.

EFFINGHAM, a co. in s.e. Illinois, on Little Wabash river; intersected by the Illinois Central, the St. Louis, Vandalia, and Terre Haute, and the Ohio and Mississippi railroads; 500 sq. m.; pop. '70, 15,563. The surface is mostly prairie and the soil fertile, producing corn, wheat, etc. Copper, iron, coal, and lead are found. Co. seat, Effingham.

ÉGALITÉ, PHILIPPE. See **ORLÉANS, LOUIS PHILIPPE JOSEPH**, *ante*.

EGERTON, FRANCIS. See **BRIDGEWATER**, *ante*.

EGG, AUGUSTUS LEOPOLD, 1816–63; b. London; painter and member of the royal academy. He was a well-trained and talented painter of *genre*, chiefly of compositions from poets and novelists. At the time of his death he might be ranked among our best painters in his special class, but he had no marked originality of style. Among his works are "Queen Elizabeth Discovers She is no Longer Young;" "Peter the Great Sees Catherine for the First Time;" "Charles I. Raising the Standard at Nottingham;" "The Night Before Naseby;" and the dinner scene from the *Taming of the Shrew*.

EGYPTIAN ARCHITECTURE. There is no reason to question the originality of Egyptian architecture, and the structures of Egypt are probably the oldest specimens known in the world. It is remarkable for its solidity. The great pyramid, erected by Cheops as a tomb for himself, was built of stones 30 ft. in length, quarried in the Arabian mountains, and conveyed by the Nile to a newly-constructed road $\frac{1}{4}$ of a mile long, 60 ft. broad, and in a cutting of 48 feet. This road was of polished stone, elaborately carved, and required 10 years for its completion. The Egyptians attained great proficiency in the mechanical arts. They possessed not only the power of polishing and carving granite with great facility, but were able to quarry the hardest stone, and raise huge blocks that would task the ingenuity of modern engineers. Next in importance is the sphinx, on which an inscription has been found which seems to prove that it was sculptured before the time of the first pyramid. The tombs of the Egyptians were in the form of truncated pyramids, and built principally of well-squared stone. The grandest architectural efforts of the Egyptians were displayed in their temples, which were first built about the time Thebes became the capital, or 2000 B.C. They were often used as citadels, as few of the towns were fortified. The temple of Edfoo in Upper Egypt is more perfectly characteristic of the arrangement and style of the national temples than any other. The earliest forms of columnar architecture are found in the rock-cut tombs and temples, the principal being that of the palm-tree column, resembling that tree with only the crown leaves. Burnt or sun-dried bricks, marble, granite, and many other materials were used in the construction of buildings. The roofs were of great masses of stone, requiring the use of interior columns; they were flat, but inclined so as to shed rain. The pyramid was the model for all buildings. Minarets and domes were unknown; rude arches were used in the 16th c. B.C., but huge stones were employed for covering lintels and doors, and the arch was neglected. The oldest houses had walls inclined inward, and were but one story high; they were ventilated by a wind-shaft over two screens, like large fans, bending each way to catch the air and direct it down the shaft into the house. The decorations were principally hieroglyphic and emblematic. In 1836, the authorities of New York planned a new prison, originally selecting a style to represent some of the discoveries made in Yucatan a few years before by the traveler John L. Stephens; but finally they decided upon the Egyptian style, and the result is now seen in the prison edifice on Center street known as "The Tombs."

EGYPTIAN LANGUAGE AND LITERATURE. The origin of the most ancient language of Egypt, the hieroglyphic, is unknown. It can be traced, however, as far back as the 3d dynasty, and the date of its discovery was no doubt much earlier than 3000 B.C. It has some points of affinity with the Semitic languages, while differing widely from them in many particulars. Some of its words appear to be of Indo-European origin, and some writers have even placed it in that family of languages. It had two dialects—those of Upper and Lower Egypt; and from these sprang another, the vulgar dialect, which became the national language just before the adoption of the Coptic. The characters of the ancient language present a very complex system, partly pictorial

and symbolic, and partly syllabic and alphabetic. Out of this grew the hieratic or common written form of the language, principally used for documents written on papyrus. The demotic writing is a form of the hieratic employed for legal documents from the 26th dynasty downwards. The oldest demotic papyrus is in the museum at Turin, and dates back to 620 B.C. It was used till the 2d c. of the Christian era, after which there was a gradual transition to the Coptic, which is the exclusive vehicle of Christian Egyptian literature. The language nearly died out in the last c., making way for the Arabic. The chief change in the Coptic was in the introduction of Greek words, especially of the religious class. The Coptic is written with the Greek alphabet, with the addition of six new letters and a ligature, the letters being taken from the demotic to express sounds not used by the Greek. The ancient Egyptian literature, which scholars during the last fifty years have been laboring to decipher and systematize, has not fulfilled the expectations excited by the discoveries of Champollion. Historically considered it is very unsatisfactory, through lack of system. The religious documents are still less orderly. Of the religious works the most important is the *Book of the Dead*, which is a collection of mythical prayers referring to the future state of the disembodied soul. In spite of the best efforts of De Rougé, a man of the highest critical faculty, to present it to us in its most favorable form, it is greatly confused, marked by poverty of thought. The temple inscriptions are stilted and monotonous; but some of the hymns found in the papyri are of a higher order. The historical writings, so far as they are official, are in the worst style of panegyric. Some of the letters present a lively portrayal of the manners of the people. Champollion and his followers have done the world a valuable service in unfolding the mysteries of the ancient Egyptian writings. Though the disclosures thus far made are less important than was anticipated and there are still many perplexing problems to be solved, the fault is not theirs. It is impossible to see any evidence of a chronological development of Egyptian literature, its characteristics being the same in all periods. The religion of Egypt has been generally regarded as polytheistic, but De Rougé thinks it rested upon a monotheistic foundation, the religious writing speaking of one supreme being, self-existent, self-producing, the creator of heaven and earth. Polytheism, whether or not the earliest form of belief, probably held its ground with monotheism. The literature seems to present a mixture of both. The many deities may have been held subordinate to the one supreme and self-existent being, but this was a low form of monotheism, though it may have been a step upward from thorough polytheism. Works of fiction or amusement prevailed in the time of Rameses, and historical accounts during the reigns of the Ptolemies; while homilies, rituals, and other Christian literature entered the country during the Coptic period. Of the magical literature there are many specimens, in which are recorded the conflicts between the good and evil powers, and the incantations, injunctions, and threats of the conjurers. The medical papyri make it probable that the Egyptians had a science of medicine long previous to 3000 B.C. The earlier practice appears to have been rational, without any superstitious intermixtures. Their remedies embraced the milk of animals, honey, salt, vinegar, etc., the application of raw flesh, ammonia, lard, and prescriptions of draughts, unguents, and injections. The later documents are of an inferior kind, containing much magic and incantation. The scientific treatises are of more value, showing that the Egyptians were acquainted with the true motion of the planets, the earth included. They also had an understanding of geometry. Prominent among the ancient epics is that of Pentaur, which has been called the Egyptian Iliad and is several centuries older than the Greek. A translation of it by prof. Goodwin will be found in *The Cambridge Essays*. The satirical writings do not even spare the sacred person of the king. Of judicial documents many have been discovered.

EHNINGER, JOHN WHETTON, b. N. Y., 1827; a graduate of Columbia college, and pupil of Couture, the French painter. Among his works are "Portrait of Peter Stuyvesant;" a study from Irving's "Knickerbocker's History of New York;" "Love me, Love my Horse;" "The Sword;" "The Foray;" "Lady Jane Grey;" etchings for Hood's "Bridge of Sighs;" for Longfellow's "Miles Standish;" etc.

EICHBERG, JULIUS; b. Germany, 1825; educated in the conservatory at Brussels; musical director in Germany and Switzerland. In 1856, he established a musical conservatory in Boston, Mass., where he was for several years teacher of music in the public schools. He has written *The Doctor of Alcantara*; *The Rose of Tyrol*; and other operas.

EIGHT-HOUR LAW, an act adopted by the U. S. congress in 1868, and subsequently by the legislatures of a number of the states, providing that in all government employment eight hours shall constitute a day's work. It was expected that this would have an influence on the practice in private employment. However desirable this result, the expectation has as yet been realized in only a small degree, as the labor-market seems to develop its own laws in its own time and way.

EILDON HILLS, three peaks in Roxburghshire, Scotland, near the romantic village of Melrose, commanding a view of the splendid scenery of the region. The story is that the renowned wizard, Michael Scot, found but one mountain there but divided it into three peaks. None of them are over 1400 ft. in height.

EISENBURG, or **VAS VARMEGYE**, a co. in w. Hungary, on the border of Styria: 1782 sq. m.; pop. '70, 331,602. It is mountainous, fertile, and well watered. The productions are coal, mineral waters, quicksilver, corn, wine, fruit, and tobacco. Chief town, Szembathely, or Stein-am-Anger.

EJECTMENT, ACTION OF (*ante*). In the state of New York, as early as 1830, actions for ejectment were placed upon substantially the same ground as that established in England in 1852 by the act 15 and 16 Vict. c. 76. If the plaintiff succeed in his action upon this ground, he has cause for another action to recover for the loss sustained by the defendant's wrongful possession. This is called an action of trespass for intermediate profits. In some states the two causes of action may be joined in one.

EKRON, the most northerly of the five cities of the Philistines. It was assigned to Judah, but afterwards given to Dan. Before the monarchy it again came under the rule of the Philistines. It was the last place to which the captured ark of the covenant was taken by the Philistines, before its restoration to the Israelites. After David's victory over Goliath, the Philistines were pursued as far as this place. The name occurs in cuneiform inscriptions and on Syrian monuments. The site has been recognized in Akir, a Moslem village 5 m. s.w. of Ramleh. It has a dreary and forsaken appearance.

EL-ARA'BAH is the name of the great depression of country which extends from the Dead sea to the gulf of Akabah. From the foot of Mt. Hermon to the Elanitic gul. of the Red sea there is a deep valley that is classed by geographers among the most remarkable depressions on the globe. It is divided by a line of chalk cliffs, which cross it about 6 m. s. of the Dead sea. North of these the valley, at the present day, is named El-Ghor (q.v.); s. of them the old Hebrew name El-Arabah is retained. The whole length of this part is about 100 miles. Its greatest width, 60 m. n. of the gulf of Akabah, is from 10 to 12 m.; its least at the gulf, not more than 3 or 4 miles. On the *western* side are the horizontal lines of the Tih, white and desolate, mounting up 1500 or 1800 ft. from the valley by huge steps, with level barren tracts on their tops, and crowned by the plateau of "the wilderness of the wanderings." This range has two principal passes; one, very steep and difficult, is close to the gulf, and is known simply as "the pass." Through it the Mecca pilgrims climb. The other, on the road from Petra to Hebron and leading up from the plateau to a level 1000 ft. higher, is probably the point at which the Israelites, when attempting against the divine command to "go up" into the promised land, were repulsed by the Amalekites coming down from the hill. On the *eastern* side are the mountains of Edom, which rise to a height of more than 2,000 ft., and are crowned by Mt. Hor, 5,000 ft. high. These mountains are verdant, and in many parts cultivated, yielding good crops. Ruined towns and villages abound, attesting the former prosperity of the country. The numerous wadys, which come down from the mountains, generally contain streams sufficient to keep vegetation alive. One of these begins near the Akabah, leading by the back of the range to Petra, and thence to the Dead sea. Along it there are traces of a Roman road. Another gives the most direct access from El-A. to Petra. After the discovery that a prolonged depression exists from Mt. Hermon to the Red sea many persons naturally assumed that the Jordan formerly flowed through its whole extent. But this theory is sufficiently disproved by the levels, imperfect as they are, which have lately been taken of the Jordan and the Dead sea. These have been found to be below the level of the gulf of Akabah and the drainage of the northern portion of El-A. is into the Dead sea, and that of the southern portion into the gulf.

ELATIN. See **OLEINE**, *ante*.

ELAM, or **SUSIANA**, an ancient name of the mountainous district e. of Babylonia, stretching from India to the Persian gulf, including a low tract of fertile land in which are the marshes around the mouths of the Tigris and Euphrates. Its inhabitants were mostly nomadic. In certain portions it produces large quantities of grain. The chief city and capital was Shusan, or Susa.

EL-ARAIISH, or **L'ARAIISH** (Fr. Larache), a t. in Morocco, on the Atlantic ocean, 45 m. s. of Tangier, well situated on a rocky height, and the seat of a military governor. It is one of the most frequented ports on that part of the coast. Pop. about 5,000.

ELASMOSAURIANS, gigantic marine saurians of the cretaceous epoch. One species had vertebrae nearly as large as those of an elephant. It was like a whale in bulk, with a long flexible neck, paddles short, tail serpent-like, skull light with a long flat muzzle with nostrils or spout-holes near the orbits, teeth sharp and well fitted for seizing fish. It reached 45 ft. in length. Its remains have been found, especially in New Jersey.

ELASTIC CURVE, according to James Bérnoulli, the figure which would be taken by a thin horizontal elastic plate if one end was fixed and the other loaded with weights.

ELATEA (anc. **CITHÆRON**), a mountain range in Greece, between Bœotia and Attica, frequently mentioned by the early poets. The highest peak is a little over 4,600 ft. above sea-level.

ELATH, or ELANE (now AILAH), a t. in Idumea on the shore of the Elanitic gulf of the Red sea; the place where Solomon fitted out his ships for bringing treasures from Ophir. David captured it from the Edomites. It is an important point in the route between Medina and Cairo.

ELBERT, a co. in n.e. Georgia, on the Savannah river; 514 sq. m.; pop. '70, 9,249—4,863 colored. Surface hilly, with much forest land; soil fertile, producing corn, cotton, etc. Co. seat, Elberton.

ELBERT, SAMUEL, 1748-88; b. S. C.; served in the revolutionary army, rising to col. In 1785, he was elected governor of Georgia.

EL DORA'DO, a co. in e. California, reached by the Sacramento and Placerville railroad, drained by branches of the American and the Cosumne rivers; 1872 sq. m.; pop. '70, 10,309—1582 Chinese. It is mountainous, and much of the surface is yet covered with forests of oak and pine. The Sierra Nevada mountains cross the e. part. In the low lands the soil is fertile; but gold-mining is the leading business. Co. seat, Placerville.

ELEANOR OF AQUITAINE, 1122-1204, Queen of France and afterwards of England, was the daughter of William IX., the last duke of Guienne. She succeeded her father in 1138, and was married the same year to Louis VII. of France. Her lively and somewhat frivolous manners, and her love of pleasure, did not fit her for the society of a husband who was naturally austere, and who from religious conviction had adopted many ascetic habits. They became gradually estranged, and in the Holy Land, whither she accompanied him in 1147, their quarrels became so frequent and so bitter that at last a divorce was agreed upon, which, on their return to France, was completed under the pretext of kinship, 1152. Six months afterwards she gave her hand and her possessions to Henry of Navarre, who in 1155 mounted the throne of England as Henry II. That the duchy of Guienne should thus become permanently annexed to the English crown was naturally displeasing to Louis, and the indirect consequence of his displeasure was protracted wars between France and England. In other respects, the marriage had unhappy consequences. The infidelities of Henry, and the special favors he showed to one of his mistresses, so greatly aroused Eleanor's jealousy that she incited her son Richard to rebellion, and also intrigued with her former husband to get him to lend his influence to the great league formed against Henry in 1173. Her son had fled to Louis, and she was preparing to follow him when she was arrested and placed in confinement, where she remained till the death of her husband, 1189. As soon as he died she regained her liberty, and reigned as regent until Richard's arrival from France. She also held this position during Richard's absence in the Holy Land, for which he left in 1190. After his escape in 1194 from the captivity which befell him as he was returning home, she retired to the abbey of Fontevrault, where she died. There is a curious story told of Eleanor by Higden, monk of Chester, relating to one of Henry's mistresses known as "Fair Rosamond," of whom the queen was extremely jealous. Higden says: "She was the fayre daughter of Walter lord Clifford, concubine of Henry II., and poisoned by queen Eleanor, A.D. 1177. Henry made for her a house of wonderful working, so that no man or woman might come to her. This house was named Labyrinth, and was wrought like unto a knot in a garden called a maze. But the queen came to her by a clue of thredde, and so dealt with her that she lived not long after." From *Encyclopædia Britannica*, 9th ed.

ELEATIC SCHOOL, a sect of Grecian philosophers during the century preceding the Peloponnesian war, 530-430 B.C., deriving its name from Elea (or Velea), a city on the western coast of southern Italy, founded 540 B.C., by the Phocæans. The general characteristic of the school was the maintenance of a distinction between the apparent and the intellectual universe, between transient phenomena and everlasting truth. It includes the pantheistic idealism of Xenophanes and Parmenides, and the skeptical materialism of Leucippus and Epicurus. Consequently there are two divisions of the school: I. *The Eleatic proper*; II. *The Epicurean*. The former asserted the divine unity to be the origin and essence of all things; the latter confined its attention to the earthly and material side of the problem, not denying the immaterial and spiritual, but renouncing it as unattainable: the former disregarded the sensible elements, the latter the divine. But neither denied what it renounced. This article is concerned only with the former, or the Eleatic school proper. The shadowy character of its philosophy makes it difficult of determination, and only a few fragments of its writings remain. Its principal expounders must be taken as representatives of its different phases: 1. XENOPHANES, 618-522 B.C., of Colophon, in Asia Minor, emigrated to Sicily and perhaps to Elea. His philosophical views were given in his poem "On Nature," fragments of which remain, but not sufficient to afford a clear exhibition of the whole. He seems to have held an idealism obscure, imperfect, and conflicting. He adopted the conception of Pythagoras, that there must be an ultimate term of being which is not the visible universe but the divine intelligence. He denied that anything could have a beginning, or could become what it had not always been. But if nothing begins or becomes, then all things are an eternal unit. The unity of the Godhead is asserted against polytheism, and the individuality of the Deity against the dualism of conflicting forces. The sub-

stantial reality of the visible world is denied; God and the universe are made one. The divine essence is unchanging, eternal, infinite. The actuality of sensible facts is admitted; the reality of them is denied. They are shadows of the eternal. All things are incomprehensible, certain knowledge is impossible; the eternal and the divine are unintelligible and truth unattainable. Xenophanes anticipated geology, contributing to science the beginning of the modern investigations. He held to the periodical destruction of the world by water, as Parmenides, who followed him, did to its destruction by fire. With all the contradictions and errors of his system he is to be honored as among the first to introduce into Greek philosophy elevated conceptions of the grandeur, glory, and sovereignty of a divine intelligence. 2. PARMENIDES, born, probably at Elea, about 536 B.C., was a disciple of Xenophanes, to whose views he gave a more logical development. Fragments only of his own statements remain, which have to be supplemented chiefly from the attacks of his adversaries. Aristotle commends him for his clearness of thought, and asserts concerning him that, "looking up to the whole heavens, he declared the one only being to be God." Yet, in improving the forms of his system he perhaps injured its substance; for his starting-point seems to have been not the infinite intelligence, but the abstract conception of being. He shows clearly the conflict between the judgments of the senses and the conclusions of the reason. The essence of his scheme is the contradiction of entity and nonentity. What is cannot be non-existent; but everything that exists. And, as nothing can proceed from non-existence to existence, all existence is eternal and unchangeable. All changes and motions are appearances only. Being is indestructible. In these speculations one cause of confusion and extravagance was the use of ambiguous and vague language. This defect showed the necessity of precise terms and of valid arguments. It thus prepared the way for logic. 3. ZENO, unquestionably a native of Elea, was the pupil, friend, and defender of Parmenides. His method of setting forth his views led to great changes in philosophy, among which were the questions of Socrates, the dialectics of Plato, and the organon of Aristotle. He is the inventor of regular logical methods, though Aristotle claims for himself that while his predecessors had provided only the forms of reasoning, he had created the art. But while Zeno gave greater clearness to the views of Parmenides by his logical precision, he also made their errors and dangers more manifest. He arrayed reason against experience, and led the way for the sophists. 4. MELISSUS, of Samos, though not directly connected with the Eleatic philosophers, is numbered among them, because of the similarity of many of his views. He confined his attention chiefly to the negative aspects of the system, denied the reality of visible things, and thought it inconsistent to ascribe time, change, or limitation to the solitary existence. He seems to have thought that knowledge of God is impossible; and in his conception of him, as Aristotle said, inclined towards materialism. The Eleatic school proper was thus verging towards the second or Epicurean branch. Imperfect and erroneous as it was, it nevertheless awakened men in that early age to consider the vanity of merely temporal things; exposed the fallacies of polytheism; affirmed the existence of a supreme Intelligence, omnipotent, omnipresent, infinite, and eternal; and called human reason to hold communion with the sovereign power in which all creatures "live and move and have their being."

ELECTION, in law, the choice between alternating and incompatible rights or claims; as when an insurance company, according to the terms of its policies, elects whether it will pay in cash for property insured and destroyed, or replace the same in kind and value. This right of alternative choice is of special importance in equity practice, in which instances are constantly occurring.

ELECTION, in politics, is the choice of public officers by popular suffrage, in distinction from "appointment" of those in a lower by those in a higher grade. Popular elections were not unknown in ancient times and in the middle ages. The system has had a slow development in England, and has been imitated and improved by other countries. In the United States, elections are of three grades—1. Local or municipal; 2. State; 3. National. State elections are for executive and legislative, and sometimes for judicial officers. National elections are held once in two years for the choice of members of congress, and once in four years for the choice of electors of president and vice-president of the United States. Elections are also sometimes held for the adoption or rejection of state constitutions or of amendments of the same. The provisions for local, municipal, and state elections are made in each state by the legislature thereof. The arrangements of national elections are made in part by state and in part by the national authority, the latter being supreme within its sphere, defined by the constitution.

ELECTORAL COMMISSION, the body of men provided for by act of Congress, Jan. 29, 1877, to settle certain disputed questions in regard to the electoral votes of several states in the presidential election of 1876. The commission was composed of 5 senators, chosen by the senate; 5 members of the house of representatives, chosen by that body; and 5 associate justices of the supreme court, 4 of whom were designated by the act of congress, and the fifth selected by the four. The senate at the time was controlled by the republican party, the house of representatives by the democratic party, and there was thought to be danger of civil commotion in regard to certain questions likely to arise in the counting of the electoral votes of the several states in presence of the two houses. In these circumstances, a majority of each of the two

political parties in congress, acting in a spirit of patriotism honorable to themselves and the country, agreed to create a commission to be constituted as above described, to which should be referred for judgment and decision the question which of two or more conflicting certificates received from any state of the votes cast by the electoral college of such state for president and vice-president in the election of 1876 was the certificate provided for in the constitution of the United States: the judgment of said commission in any matters referred to it, unless set aside by the concurrent action of the two houses of congress, was to be final. The proposed law was thereupon enacted, and in conformity with an understanding between the two political parties, the senate appointed 3 republicans, and 2 democrats, and the house of representatives 3 democrats and 2 republicans as members of the commission. Of the 4 associates of the supreme court who were named in the law, 2 were understood to be democrats and 2 republicans; and these selected, as the fifth associate justice to serve with them upon the commission, Mr. Justice Bradley, a republican. The commission was constituted as follows: Justices Clifford, Strong, Miller, Field, and Bradley; senators Edmunds, Morton, Frelinghuysen, Thurman, and Bayard; and representatives Payne, Hunton, Abbott, Garfield, and Hoar. Justice Clifford, by seniority of appointment to the bench, was by law president of the commission. As the counting of the electoral votes in the presence of the two houses of congress proceeded according to custom, it was found that there were conflicting certificates from four different states—Florida, Louisiana, Oregon, and South Carolina; and the two houses were unable to agree in either case which certificate should be received as genuine. The certificates and accompanying papers were therefore successively referred to the commission, who proceeded to hear argument upon the questions involved. The result in each case was a decision of the commission, by a vote of 8 to 7—the vote following the exact line of party division in the body—that the certificate of the electoral votes cast for Hayes and Wheeler, the republican candidates for president and vice-president of the United States, was the certificate which contained the lawful electoral vote of said state, and that the other certificates were illegal and void. The republican senate concurred in this judgment in each case, while the democratic house of representatives dissented. The decision of the commission, therefore, according to the terms of the statute, became irrevocable, and the said electoral votes were counted accordingly; and Rutherford B. Hayes and William A. Wheeler were found duly elected, by a majority of one electoral vote, respectively president and vice-president of the United States for the term of 4 years, from the 4th of Mar., 1877. The controlling question before the commission was whether an electoral certificate being in form confessedly according to law, it was competent for congress or the commission to go behind the same and take evidence *abundant* in support of alleged irregularities and frauds committed before such certificate was issued. Upon this question the democrats in congress and in the commission took the affirmative, while the republicans took the negative. The reasons of the latter for taking this ground were clearly set forth in the reports of the majority of the commission to the two houses in congress upon the matters referred to that body.

ELECTRA, daughter of Agamemnon and Clytemnestra, and sister of Iphigenia, Chrysothemis, and Orestes. Clytemnestra and her children were famous for their crimes and sorrows, and fill a large place in Greek poetry and drama. The *Electra* of Sophocles is one of the great dramas of antiquity. Electra married Pylades, the close friend of her brother Orestes, and became the mother of Medon and Strephon. Others of the name E. appear in Greek mythology.

ELECTRIC COLUMN, or DRY BATTERY; invented by De Luc. It is formed by a great number of alternating disks of paper, silver leaf, and zinc leaf. When the air is very dry it will hardly work; but under ordinary atmospheric conditions it generates a feeble current.

ELECTRIC LIGHT (*ante*). The machines which are now used for generating the light-producing current are described in the article MAGNETO-ELECTRIC MACHINE. The more recent inventions of electrodes for producing light are those of Jablochhoff, Lodyguine, Kohn, Sawyer, and Edison. The first of these produces the light by the electric arc; the others by the incandescence of some refractory substance, as carbon or platinum.

The principal difference between the Jablochhoff light and the ordinary arrangement with carbon points is in a provision by which the current is reversed from time to time so that the more rapid consumption of the positive electrode is made to take place with one and the other point alternately. When the apparatus is started, there is also a slight bridge of carbon between the two points through which the current passes before the arc is established. The carbon rods are placed parallel and near together, so that a uniform distance may be maintained during their consumption. A pair of carbon points constitutes a "candle," and four candles are usually placed in a globe of opalescent glass. Each candle burns about one hour and a half, so that the set of four will give light about 6 hours, the change of electric action from one candle to another being accomplished by an automatic switch. The motive power required in the Jablochhoff lamp is about one-horse power applied to a magneto-electric machine for each candle, and each such candle is said to have a light value of 700

standard candles; but this, from the absorption of light by the opalescent glass, is reduced to that of 300 candles. In 1873, M. Lodyguine, a Russian as well as Jablochkoff, invented a lamp which gave light by rendering carbon incandescent by the electric current. A portion of the conducting rod of carbon was made much thinner than the rest, so that the increased electrical resistance in that part would cause it to become intensely incandescent. The carbon rod was inclosed in a glass vacuum chamber, but the apparatus was not practically successful, as the carbon wasted too rapidly, and required too frequent replacement within the vacuum chamber. In 1875, M. Kohn of St. Petersburg patented an arrangement intended to obviate this difficulty by a device having the same object as that in the Jablochkoff lamp, viz., to supply the place of the consumed carbon with a new piece. This lamp has been used with considerable success. The Sawyer lamp has the following characteristics: It employs the resistance of a small piece of carbon, placed in an air-tight glass cylinder filled with pure nitrogen, which, being a non-supporter of combustion, protects the carbon in a manner like that of a vacuum, the advantage claimed being that it is easier to keep a vessel full of pure nitrogen than to maintain a vacuum, because of the equality of the inward and outward pressure. The heat produced is prevented from reaching the mechanism at the base of the apparatus by having the copper standards present a great radiating surface. Diaphragms are also placed so as to cut off much of the downward heat rays, and a switch device is employed to prevent the too sudden turning on of the current, and thereby prevent crumbling by too sudden heating.

The experiments of Mr. Edison on the electric light have been in progress about two years, in which time he has used various substances for the incandescent material. He commenced with platinum, and employed a device by which the galvanic current would be reduced when the metal approached the melting point. This device consisted chiefly in placing within the fine platinum spiral a rod of the same metal which would be moved, on the principle of the pyrometer, one way or the other by a lever, and thus cool by its presence the incandescent spiral when it became too hot. But this device did not prove successful. Another arrangement employed heated air acting upon a diaphragm as the regulating power. The various metals which he used soon became oxidized and rendered useless. He then gave his attention to perfecting the vacuum employed by Lodyguine in 1873. Edison's platinum lamp as perfected consists of a long coil of platinum coated with calcined magnesia, supported by a platinum rod within a glass vacuum tube, which rests upon a metal frame containing the regulating apparatus. It is claimed that Edison has produced a vacuum more perfect than any other, so that only one millionth of an atmosphere remains. His attention was called from the use of platinum to that of small threads of carbon, made by charring cotton thread in a vacuum with the electric current. Light of great intensity was obtained in this way. He experimented with various forms of woody fiber, but finally found that nothing gave more satisfactory results than charred paper. Bristol card-board cut in the shape of a small horse-shoe, the strips being about 2 in. long, and an eighth of an inch wide, and laid upon one another in an iron mold, being separated by tissue-paper. When the mold is packed, it is placed in an oven and gradually heated to 600°; afterwards, in a furnace, to a white heat. The carbonized product is then carefully removed and placed in a small glass globe, and made the resisting portion of the galvanic circuit; the globe is then exhausted and sealed air-tight.

ELECTRO-DYNAMIC ENGINE. See MAGNETO-ELECTRICITY and MAGNETO-ELECTRIC MACHINE, *ante*.

ELECTROTYPE, PHOTOGRAPHIC. Much thought and labor have been expended in producing a relief-plate to take the place of wood-engraving, and various methods of etching on metal by the aid of photography have been brought to light. The earlier of these never were successful, because after the acid has eaten or etched below the surface protected by the asphaltum, there is nothing to prevent it from undermining the lines, as the acid will eat in one direction as well as another, thus weakening them to such an extent that they often break down in printing. With the gelatine process, the gelatine must be of a thickness compatible with the depth desired. A gelatine of this thickness will become nearly, if not quite, insoluble before it is dry, through the action of bichromate alone. Also the color of the gelatine, after the bichromate has been added, is such as to prevent the action of light from penetrating to the proper depth in the time during which it can be exposed. These are the almost insurmountable reasons why a relief-plate in gelatine has not been obtained till the advent of a new process, called photo-electrotype. W. H. Mumler, of Boston, Mass., has now succeeded in overcoming these obstacles. After printing upon his gelatine, through a negative, the necessary time to secure all the details, the parts unaffected are dissolved away to a slight depth. The interstices are then filled with a black paste, when it is again exposed to light; the soluble parts that were protected by the opacity of the negative in the first printing are now protected from the action of light by the black paste that covers them. The second exposure may be continued for a length of time sufficient to allow the light to penetrate its entire depth; and the action of light being to render the gelatine insoluble, it can readily be seen that the protected parts can be dissolved away to the depth to which the light has penetrated. The gelatine relief is then placed in a drying

closely for a few hours, when it becomes as hard as horn. From this an electrotype is taken in precisely the same manner as from a wood-cut. It is then mounted on mahogany blocks, type high, when it is ready for the press. The result is an electrotype plate with a surface as smooth as polished plate-glass, and a depth far exceeding that of ordinary wood-cuts. See PHOTOGRAPHIC ENGRAVING.

ELEMENTS, CHEMICAL (*ante*). See **CHEMISTRY**, *ante*, and **ATOMIC WEIGHTS**, *ante*. Progress in chemical science presents the names of several substances which claim admission to the list of elements, with varying degrees of confidence. All are constituents of rare minerals, and none of them are likely to acquire much importance in practical affairs. The small quantities yet found have made the discussion of their oxygen compounds very difficult, and leave their appropriate atomic weights liable to different determinations.

The following list gives their status as known in Mar., 1880:

Name.	Symbol.	At. w't.	Discoverer and Remarks.
Terbium	Tb.	99.	{ Mosander in 1843, but discredited till recently, when shown to exist by M. Delafontaine.
Gallium	Ga.	69.9	
Decpium	Dp.	114	{ Lecoq de Boisbaudran. White, sp. gr. 5.93.
Phillipium	Pp.	171.9	
Ytterbium	Yt.	82	{ M. Delafontaine.
Scandium	Sc.	123.9	
Norwegium	Ng.	116.9	{ M. Marignac. L. F. Nilson thinks to show the atomic weight to be 132.
		173.01	
		Undetermined.	{ L. F. Nilson in a Scandinavian mineral.
		145.9	
			{ Teleff Dahll, in copper-nickel, color white, melts at 350°C. Sp. gr. 9.441.

Other reported elements are: Mosandrium, a mixture of known metals; Ilmenium, probably a similar mixture; Neptunium, insufficiently characterized; Davyum, not authentic; Holmium is Phillipium; Thulium and Ouralium need confirmation. The revised weight of Thorium is 231.5 (oxide, TiO_2); Yttrium, 58.5 or 88.3; Erbium, 106 or 159; Indium, 113.4 (oxide In_2O_3).

ELEUTHERIA, a festival of the Greeks, to commemorate their deliverance from the invader Xerxes, instituted after the battle of Platea, 479 B.C. There was a semi-military parade, eulogies on the heroes who fell in the great battle, the sacrifice of a bull to Jupiter and Mercury, and the sprinkling of the ground with wine.

ELEVATION OF THE HOST (*Host*, *ante*). Members of the church of Rome worship the host under the assumption that the bread and wine in the Lord's supper are transubstantiated into the real body, blood, and divinity of Christ, who is, on each celebration of the sacrament, offered up anew as a victim (*hostia*) by the priests. The council of Trent, having determined that upon consecration the bread and wine of the sacrament are changed into the body of the Lord Jesus Christ, true God and true man, gave this decision: "There is, therefore, no room to doubt that all the faithful in Christ are bound to venerate this most holy sacrament, and to render thereto the worship of *latria*, which is due to the true God according to the constant usage of the Catholic church." In conformity with this decision, the rubric of the missal says: "Having uttered the words of consecration, the priest immediately, falling on his knees, adores the consecrated host; he rises, shows it to the people, places it on the corporale, and again adores it." Rising up after he has adored it, he elevates it before the people, who, as soon as they see it (having notice also by the ringing of the bell), fall down in humble adoration to it as if it were God himself. They pray to it, and use the same acts of invocation as they use to Christ. The host is also elevated for worship when it is carried through the streets in solemn procession, on its way to the dwellings of the sick, or on the feast of Corpus Christi, or before the pope. The custom of thus elevating the host was introduced into the church of Rome in 1216, the year after transubstantiation was made an article of faith. Pope Honorius then ordered that the priests, at a certain point of the mass service, should lift up the host and cause the people to prostrate themselves in worshipping it.

EL-GHOR, "*the valley*," is, according to Robinson (*Phys. Geog.*, p. 73), the name now given to the northern part of the great depression which extends from the base of Mt. Hermon to the Red sea. The southern part retains the old Hebrew name, El-Arabah (q.v.), the boundary between the two being the range of chalk cliffs about 6 m. s. of the Dead sea. The length of El-Ghor, from the sea of Galilee to the Dead sea, is about 65 m., and between these points there is an average descent of over 10 ft. to a mile. The width of the valley varies from about 6 m. at the northern end to 10 or 12 in the neighborhood of Jericho. On the w. is a series of irregular and precipitous cliffs from 800 to 1200 ft. high, everywhere naked and desolate; on the e. the mountains are still higher. About 22 m. s. of the sea of Galilee the ridge Kum Surtabeh, crossing the valley obliquely, divides it into the upper and lower Ghor. At this point there is a sudden "break-down"

in the bed of the Jordan. Above it the valley is generally well-watered and fertile; below, it becomes dry and desolate, being covered with a white nitrous crust. Within the general valley of El-Ghor there is a still lower depression, varying from a quarter to a half of a mile in width, through which the Jordan flows (q.v.).

ELGIN, a co. in the province of Ontario, Canada, on lake Erie and Thames river; intersected by the London and Port Stanley railroad; 725 sq.m.; pop. 71, 33,666. The co. town is St. Thomas.

ELGIN, a city in Kane co., Ill., on Fox river, at the junction of the Chicago and Pacific, and the Freeport and Dubuque branch of the Chicago and Northwestern railroads; 35 m. w. of Chicago; pop. 70 (of township), 5,441. The city is on both sides of the river, which affords abundance of water-power. The Elgin National Watch company is the most important of several manufacturing establishments, and its watches, made by machinery, are highly esteemed, and have an extensive sale. Elgin is the center of a fine agricultural region, and has a good trade.

ELGIN, **THOMAS BRUCE**, Earl of, 1766-1841; the seventh of the line, succeeding his brother in the earldoms of Elgin and Kincardine when but seven years old. He rose to be gen. in the British army; was envoy at Brussels, at Berlin, and at Constantinople. While at the latter place he secured and removed from Athens the sculptures known as the "Elgin marbles," now in the British museum. (See **ELGIN MARBLES**, *ante*.) Lord Elgin was a representative peer of Scotland for more than 50 years.

ELI, the high-priest of Israel in the latter part of the period during which the ark of the covenant remained at Shiloh. That he was of the family of Ithamar, the youngest son of Aaron, is shown by comparing several passages of Scripture. He was probably the first high-priest in that branch of Aaron's family. His sons having died before him, the office passed to his grandson, Ahitub, and continued in his family until Solomon removed Abiathar and made Zadoc, a descendant of Eleazar, high-priest. Eli was also judge over Israel for a period of 40 years, beginning, probably, soon after the death of Samson, and extending to his own death. If his languid reproofs of the wickedness of his sons were fair specimens of his general administration, he must have been a very inefficient magistrate. The divine judgment came at length on his house for the iniquity which he knew was practiced but did not strive to arrest. His sons made themselves vile, and he restrained them not. The sentence against them, pronounced first by a prophet and afterwards by the child Samuel, was executed in a battle with the Philistines, during which the ark of God was taken and the dissolute priests were slain. When Eli, then 98 years old, heard the news, he fell backward from his seat and died.

ELIA. See **LAMB**, **CHARLES**, *ante*.

ELIAS LEVITA, 1472-1549, b. Bavaria; the most distinguished Hebraist of his time. Banished because he was a Jew, he went to Italy early in the 16th c., taught Hebrew at Venice and Padua, and lectured and wrote on Hebrew grammar. In 1512, he went to Rome, where he was so friendly with high dignitaries of the church, that he was accused of apostasy. His latest years were spent in Venice. He was the author of many works, of which the most valuable are those in Hebrew philology.

ÉLIE DE BEAUMONT, **JEAN BAPTISTE ARMAND LOUIS LÉONCE**; 1798-1874; b. France; professor of geology in the Paris school of mines; in 1833, engineer in chief of the mines of France; senator of France in 1852, and on the death of Arago chosen perpetual secretary of the academy of sciences. His best service to science was in connection with the geological map of France, on which he was employed for 18 years.

ELIOT, **CHARLES WILLIAM**, LL.D., b. Boston, 1834; a graduate of Harvard, and tutor of mathematics in that institution. In 1858, he became interested in chemistry, and went to Europe to study that branch of science. In 1865, he was appointed professor of chemistry and metallurgy in the Massachusetts institute of technology; in 1869, he succeeded Thomas Hill as president of Harvard university. His father, **SAMUEL ATKINS ELIOT**, was the author of a history of Harvard, and for nearly a dozen years treasurer of the college. Dr. E. has led in the introduction of extensive changes in the course of study and the administration of his college, tending towards the style of the European universities.

ELIOT, **JARED**, 1685-1763; b. Conn.; grandson of the "apostle to the Indians," preacher, agriculturist, and botanist; also eminent as a physician. He brought the white mulberry-tree to Connecticut. Among his works were *Agricultural Essays*, and *Religion Supported by Reason and Revelation*.

ELIOT, **SIR JOHN**, 1592-1632; an English statesman, b. at his father's seat on the river Tamar. He graduated at Oxford, studied law, and traveled on the continent, for part of the time with George Villiers, afterwards duke of Buckingham. At the age of 22, he entered parliament, and at 27, was made vice-admiral of Devon, in which office he captured the famous Nutt, a pirate whose depredations were a constant infliction upon the commerce on the southern coast. But by corrupt influences at court, Nutt was released to continue his depredations, while E. was imprisoned, on false charges, in the Marshalsea for about four months. Immediately upon his release, in 1624, he was returned to parliament, where, during the first three parliaments of Charles I., with

Pym, Hampden, Selden, and Coke, E. was the foremost leader in resistance to the encroachments of the crown, surpassing all the great statesmen of his time in his symmetrical union of learning, genius, and lofty devotion, with absolute personal bravery and the fire of oratory. He spoke out boldly against the lawlessness and venality of the ministry, and the weak, ill-tempered foreign policy of Buckingham, and urged parliament to withhold supplies until an account was given of the money already voted. For comparing Buckingham to Sejanus, he was imprisoned in the Tower in 1626; but the commons compelled his release, and exonerated him by special vote. He suffered another short imprisonment for petitioning the king against forced loans, and later received sentence of outlawry. These persecutions only increased his popularity, and though earnestly opposed by the court, he was again returned to parliament in 1628. He took part in drawing up the petition of right, and, on the last day of that parliament, read a protest against tonnage and poundage and other taxes unauthorized by parliament; and against the king's illegal encouragement of Arminians and Roman Catholics. Being summoned before the council, with Holles, Selden, Valentine, and others, he refused to answer for his acts in parliament except to parliament itself. He was then rigorously confined in the Tower, with his fellow-members, for more than two months, until manifestations of popular indignation compelled the king to bring him to trial. During tedious delays his confinement was somewhat softened; he occupied himself in writing a personal defense, and other works; and in Feb., 1631, sentence was at last given. All the prisoners were condemned to a fine, the largest, of £2,000, being imposed upon E.; to imprisonment during the king's pleasure; and not to be released until they had given security for good behavior, submitted to the king, and acknowledged their offenses. The confinement of the others was gradually relaxed, until they were all released, but E. would make no submission. Dec. 21, 1631, more than a year after his arrest, the council resolved to force him to submission. They removed him to a cold, unwholesome room, and forbade any one except his sons to visit him. His health broke down, and with medical advice he petitioned the king, in simple, manly words, for such release as health demanded. His petition was refused as not sufficiently humble. In a second petition he declared himself "heartily sorry that he had displeased his majesty," but added no words acknowledging wrong. He was denied an answer. He had now been prisoner two years, and though only forty years old, was worn out with cruel confinement. He died two weeks after the king refused his last petition. Charles even refused permission to his sons to bury him in the family tomb, and ordered that he should be buried in the church of the parish where he died. During the commonwealth his sentence of conviction was reversed by act of parliament.

ELIOT, JOHN, 1604-90; "the apostle of the Indians;" b. at Nasing, Essex, Eng. He graduated at Cambridge in 1623, and entering the non-conformist ministry, emigrated in 1631 to Boston, Mass., where he officiated for a year in the church of Mr. Wilson, who was then in England, and, in 1632, he was settled over the church in Roxbury. He soon began preaching to the Indians, acquiring their language by the help of a young Pequot, taken prisoner in 1637. He translated the commandments, the Lord's prayer, and many texts, and first preached without an interpreter in 1646, at Nonantum, now Brighton, on the border of Newton. A settlement of Christian Indians was established, and a missionary society was organized in England, of which Robert Boyle was a leading member. This society sent Eliot £50 per annum to supplement his salary of £60 at Roxbury. In 1651, the settlement was removed to Natick, where an Indian church was formed in 1660. In 1653, E. published a catechism for their use, said to have been the first work published in the Indian language; no copy is known to exist. In the same year accounts of Eliot's labors were published by the corporation in London, and in 1655, a tract containing the doctrinal and experimental confession of these Indians who had been baptized and admitted to church fellowship. In 1660, E. published in London *The Christian Commonwealth, or the Civil Policy of the rising Kingdom of Jesus Christ*, which was criticised as containing seditious principles. The governor and council of Massachusetts required him to retract some of its utterances. About this time he completed his great work, the translation of the Bible into the Indian tongue. The New Testament was published at Cambridge, Mass., in 1661, the Old in 1663. A second edition of the New Testament was printed in 1680, and of the Old in 1685. Both of these editions are now very rare; the language in which it was written has ceased to be spoken, and only one or two persons in recent times are able to read it. E. was assisted in the translation by the Rev. John Cotton, of Plymouth, Mass. A new edition was printed at Boston, 1822. E. published many other works in the Indian and in the English tongue. His well-known *Indian Grammar Begun*, printed at Cambridge, Mass., 1666 (reprinted 1822), has at the end these memorable words: "Prayers and pains, through faith in Jesus Christ, will do anything." Of his *Indian Primer* (1669), the only complete copy known to exist is preserved in the library of the university of Edinburgh. It was reprinted, 1877. In 1671, E. printed in English, at Cambridge, *Indian Dialogues, etc.*; and in 1672, *The Logick Primer*. Of the former the only known copy is in a private library in New York; of the latter work there is a copy in the British museum, and another in the Bodleian library. Even in his old age the pen of E. was not idle. He died at Roxbury, Mass., at the age of 86, having won all hearts by his simplicity of

life and manners, and his evangelical sweetness of temper, whether in the villages of the English colonists, or in the huts and wigwams of the Indians. His Indian publications are still of value for the light which they throw upon the structure and character of unwritten dialects.

ELIOT, SAMUEL, LL.D., b. Boston, 1821; graduated at Harvard, and traveled in Europe four years. He became professor of history and political science in Trinity college, Hartford, in 1856, and was president from 1860 to 1866; and in 1874, professor of political science and constitutional law in the same institution. He has published *Passages from the History of Liberty*, 1847, in which he traced the careers of Savonarola and other reformers, a work afterwards enlarged under the title *The Liberty of Rome*, 1849, and republished, with additional volumes, as *The History of Liberty*, 1853. He also published a *Manual of United States History*, 1856.

ELIOTT, or ELLIOT, GEORGE AUGUSTUS. See HEATHFIELD, LORD.

ELIZABETH, a city and seat of justice in Union co., N. J., on Newark bay and Staten Island sound, 12 m s.w. of New York; on slightly elevated ground on both sides of the Elizabeth river; reached by the New Jersey Central and the Pennsylvania railroads. It was settled under the name of Elizabethtown in 1665, and was the colonial capital from 1755 to 1757. It is well laid out with broad and well-shaded streets, and contains several small parks and many handsome residences. It is the home of a large number of men who do business in New York and travel to and fro daily upon one or the other of the railroads which meet and cross each other near the center of the city. The port is accessible for vessels of 300 tons, and receives large quantities of coal and iron brought by rail from the Pennsylvania mines for transshipment. A line of steamboats plies daily between Elizabethport and New York; a private company supplies the city with water from Elizabeth river, the streets are lighted with gas and paved. The property of the city was assessed in 1873 at \$15,563,625—probably not more than one third of its real value. Among the public institutions are an almshouse, orphan asylum, and old ladies' home. The schools, having an average attendance of from 2,500 to 3,000 children, are well cared for. The amount appropriated for their support in 1873 was \$32,000. There is a business college and a collegiate school for young men, besides several private schools. There are 24 churches, the denominations represented being Presbyterian, Roman Catholic, German Moravian, Baptist, Methodist, Episcopal, Congregational, and German Lutheran. The periodicals are three daily, one semi-weekly, and one monthly. The principal manufactures are of sewing-machines, cordage, edge tools, gas machinery, boots and shoes, carriages, zinc, combs, pottery, trunks, stoves, saws and hats. There also several foundries, breweries, and planing-mills. There are two national banks, with a total capital of \$600,000, 3 savings-banks, and several insurance companies. The city is at present in a state of financial embarrassment on account of debts incurred for public improvements of a speculative character. Pop. in '70, 20,832, of whom 6,752 were of foreign birth.

ELIZABETH, CHRISTINA, 1715-97; Queen of Prussia, wife of Frederick the great. Although Frederick was decidedly opposed to the marriage, to which he was compelled by his father, he spoke very highly, in after years, of her high and winning character. She wrote a number of works in the French language.

ELIZABETH CITY, a co. in s.e. Virginia, on James river and Chesapeake bay; 50 sq.m.; pop. '70, 8,303—5,471 colored. Corn and wheat are the staple products. Co. seat, Hampton.

ELIZABETH ISLANDS, a group s.w. of cape Cod, between Buzzard's bay and Vineyard sound, forming the town of Gosnold, Dukes co., Mass. There are 16 islands, the most important of which are Naushon, Cuttyhunk, Pasque, and Nashawena; pop. of the whole group (permanent residents) about 100. The islands have a fine climate, and afford excellent fishing. On Cuttyhunk island the foundations of the first English colony of New England were laid, in 1602, by Bartholomew Gosnold, but the place was abandoned a few weeks later. On another island, Penikese (area 100 acres), a school of natural history, connected with Harvard college, was established 1873, but discontinued in a few years.

ELIZABETO'POL, a government in Asiatic Russia bordering on Persia; 17,038 sq.m.; pop. 503,282. The principal city bears the same name.

ELK, a co. in central n.w. Pennsylvania, on the head waters of Clarion river, intersected by the Philadelphia and Erie, and Pennsylvania railroads; 700 sq.m.; pop. '70, 8,488. The surface is rough; coal-mining and lumbering are the leading occupations. Co. seat, Ridgeway.

ELKESAITES, or ELCES'AITES, Jewish Christians of the 2d c., who held as the highest authority a work known as the *Book of Elxai*. This book was known to Origen, who reports that it was believed to have fallen from heaven, and was revealed by an angel who was the son of God. Its contents were made known only upon a pledge to keep them secret. Apparently the object of the sect was to mingle Judaism and Christianity, so that the Hebrews of that day could embrace the new doctrines without entire repudiation of their old belief. The fullest account of the *Book of Elxai* is found in the *Philosophomena* of Hippolytus.

ELKHART, a co. in n. Indiana, on the Michigan border, intersected by the St. Joseph's river and the Lake Shore and Michigan Southern railroad; 467 sq.m.; pop. '70, 26,026. The surface is generally level, with extensive oak and maple forests. The soil is fertile, producing wheat, corn, etc. Co. seat, Goshen.

ELKHART, a city in Elkhart co., Ind., on St. Joseph's river, and Lake Shore and Michigan Southern railroad, 101 m. e. of Chicago; pop. '70, 3,265. Three rivers converge here, affording abundant water power, supplying a rolling mill and many other manufactories.

ELKO, a co. in n.e. Nevada, drained by the sources of the Humboldt and Owyhee rivers, and crossed by the Central Pacific railroad; 13,800 sq.m.; pop. '75, 3,602. The surface is rough, 5 or 6 mountain ranges running n. and s. through the co., between which are wide and almost barren plains, with some rich bottom lands along the rivers. There are valuable mines, especially of silver. Co. seat, Elko.

ELKO, a village and seat of justice in Elko co., Nev., on the n. fork of the Humboldt river, and on the Central Pacific railroad; 460 m. n.e. of Sacramento; pop. about 1200. The place has a large trade with the mining districts. It is the seat of the state university.

ELLAG'GIC ACID, a constituent of animal secretions such as the bezoar stones found in the antelope. It may be produced by the decomposition of gallic acid

ELLENBOROUGH, EDWARD LAW, Lord, 1750-1818; chief-justice of the court of king's bench; educated at Cambridge, and a fellow of Trinity college; studied law, and was called to the bar in 1780, speedily gaining a large practice and a high reputation. He was principal counsel for Warren Hastings in the famous impeachment trial. He began political life as a whig, but the French revolution made him a supporter of Pitt. In 1801, he was appointed attorney-general; the next year he succeeded to the king's bench as chief-justice, and at the same time was made a peer. He was also a member of the Grenville cabinet. As a judge he showed profound legal knowledge, and was especially an authority on mercantile law; but he was harsh and overbearing to counsel, and generally against any prisoner tried for a political offense. In the trial of Hone for blasphemy he directed the jury to return a verdict of guilty, but they brought in one for acquittal—an event which is thought to have hastened the judge's death.

ELLERY, WILLIAM, 1727-1820; b. R. I.; graduated at Harvard, and went into trade in Newport; afterwards began the practice of law, and in 1776 was elected to the continental congress, where, with his fellow member from Rhode Island, Stephen Hopkins, he signed the declaration of independence. With the exception of the two years 1780 and 1782 he was in congress until 1786, and was one of the most influential members. In 1790, he was appointed collector of customs at Newport, and held the office during life.

ELLETT, CHARLES, JR., 1810-62; b. Penn.; an engineer, builder of the first wire suspension bridge in the United States (over the Schuylkill, at Fairmount, near Philadelphia); architect of the first suspension bridge over the Niagara river below the falls, and of the first one at Wheeling. During the war of the rebellion he built a number of steam rams for the western rivers, with which he took part in the battle in the Mississippi at Memphis, June 4, 1862, sinking or disabling a number of confederate vessels. He received a wound on that occasion, from the effects of which he died.

ELLETT, ELIZABETH FRIES, 1818-77; b. N. Y.; wife of William H., and author of sketches, poems, etc. At 17 years of age she published a volume of poems, and about the same time wrote *Teresa Contarini*, a tragedy based on Venetian history. In 1841, she published *The Characters of Schiller*, following with *Women of the American Revolution*; *Evenings at Woodlawn*; *Family Pictures from the Bible*; *Domestic History of the American Revolution*; *Watching Spirits*; *Pioneer Women of the West*; *Novellets of the Musicians*; *Summer Rambles in the West*; *Women Artists in All Ages and Countries*; *Queens of American Society*; and *Court Circles of the Republic*. She was also a frequent contributor to periodicals.

ELLETT, WILLIAM HENRY, 1804-59; b. N. Y.; graduated from Columbia college, where he was professor of chemistry in 1832; in 1835, professor of chemistry, mineralogy, and geology in South Carolina college. The South Carolina legislature presented him with a testimonial for the discovery of a cheap method of manufacturing gun-cotton. His latest work was that of consulting chemist to one of the great gas manufacturing companies of New York.

ELLCOTT, ANDREW, 1754-1820; b. Penn. His scientific attainments caused his employment at various times for marking the boundaries of Virginia, New York, and Pennsylvania; and in 1789 he surveyed the country between Pennsylvania and lake Erie, making the first accurate measurement of Niagara river. In 1790, he laid out the proposed city of Washington, now the federal capital, and in 1796 he was one of the commissioners to settle the southern boundary between the United States and Spanish territory. Later in life he was professor of mathematics at West Point. He was an active member of the American philosophical society, and a frequent contributor to the *Transactions* of that body.

ELLICOTT, CHARLES JOHN, D.D., b. 1819; bishop of Gloucester and Bristol. He graduated at Cambridge in 1841, and was ten years rector of Pilton, Rutlandshire, but in 1858 became professor of divinity in King's college, London, and in 1860, Hulsean professor of divinity at Cambridge. In 1861, he was made dean of Exeter, and in 1863 bishop. He is the author of a *Treatise on Analytical Statics*; *The History and Obligation of the Sabbath*; *Lectures on the Life of our Lord Jesus Christ*; and *Considerations on the Revision of the English Version of the New Testament*; but his most important works are *Commentaries* of a number of the New Testament Epistles, eminent for thoroughness of grammatical criticism.

ELLICOTT CITY, the chief t. of Howard co., Md., on the Patapsco river and the Baltimore and Ohio railroad, 12 m. w.s.w. of Baltimore; pop. 1722. The soil is excellent; water power is abundant, and many flour mills and other manufacturing establishments are in operation. There are two Roman Catholic colleges in the place.

ELLIOTT, a co. in n.e. Kentucky, drained by the head-waters of the Little Sandy river; pop. '70, 4,433—22 colored. It is hilly, with much forest land. Productions, wheat, corn, etc. Iron ore and coal are found. Co. seat, Sandy Hook.

ELLIOTT, CHARLES, D.D., LL.D.; 1792—1869; b. Ireland, where he joined the Wesleyan Methodists, and prepared for the ministry. At the age of 23, he came to America, and in 1818 joined the Ohio conference; in 1822, he was superintendent of missions among the Wyandot Indians; afterwards for five years presiding elder of the Ohio district; then for four years professor of languages in Madison college (Uniontown, Penn.). He was a few years later presiding elder of the Pittsburg district, editor of the *Pittsburg Conference Journal*, and subsequently of the *Western Christian Advocate* (Cincinnati). In 1857, he became professor of Biblical literature and president of the Iowa Wesleyan university. About 1860, he became editor of the *Central Christian Advocate* at St. Louis. Among his works are *Treatise on Baptism*; *Delineation of Roman Catholicism*; *History of the Great Secession from the Methodist Episcopal Church*; *Political Romanism*; *Reminiscences of the Wyandot Mission*; *South-western Methodism*; works against slavery, biographies, etc.

ELLIOTT, CHARLES LORING, 1812—68; b. New York, the son of an architect. Having an inclination for painting, he became a pupil of Trumbull, and afterwards of Quidor. He was for some time in New York city, where his efforts began to attract attention. After working chiefly on portraits for several years in the w. part of the state, he returned to the city, where he soon became the chief of portrait painters, having at his easel many hundreds of the most eminent citizens.

ELLIOTT, CHARLES WYLYS, b. Conn., 1817; a descendant of the "apostle to the Indians." He began business as a merchant in New York, took up the study of horticulture and landscape gardening with A. J. Downing, and practiced the business in Cincinnati. Returning to New York, he became one of the founders of the "Children's Aid Society," and was chosen a commissioner to lay out the Central park. Among his works are: *Cottages and Cottage Life*; *Mysteries—or Glimpses of the Supernatural*; *San Domingo—Its Revolution, and its Hero, Toussaint L'Ouverture*; *New England History from the Discovery of the Continent by the Northmen in 986 to 1776*; *Remarkable Characters and Places in the Holy Land*, etc.

ELLIOTT, JESSE DUNCAN, 1782—1845; b. Philadelphia; midshipman in the U. S. navy in 1804, rising to capt. in 1818. He was in the *Essex* in the war with Tripoli, and on the lakes under Perry and Chauncey in the war of 1812, where he commanded a boat expedition which captured two English brigs. In Perry's great victory, Elliott commanded the *Niagara*. He succeeded Perry in command on the lakes; in 1815, he was in the Mediterranean squadron; was commissioner to select sites for dockyards, light-houses, and fortifications on the North Carolina coast; and later, commanded the *Constitution* in the Mediterranean. His conduct did not meet with approbation, and he was tried by court-martial and suspended for four years. A portion of the sentence was remitted, and he was made commandant of the Philadelphia navy-yard in 1844.

ELLIOTT, STEPHEN, LL.D., 1771—1830; b. S. C.; a botanist; graduate of Yale. He was instrumental in establishing the literary and philosophical societies of South Carolina, and was their president. He also assisted in establishing the state medical college, of which he was one of the faculty. He published *The Botany of South Carolina and Georgia*. He was for a time the editor of *The Southern Review*.

ELLIOTT, STEPHEN, D.D., 1805—66; son of the botanist; b. S. C.; graduate of Harvard; a lawyer until 1833; ordained in the Protestant Episcopal church, 1836. Soon afterwards he was appointed professor of sacred literature in South Carolina college. In 1840, he was chosen Protestant Episcopal bishop of Georgia.

ELLIOTT, WILLIAM, 1788—1863; b. S. C.; studied at Harvard; was in both branches of the legislature of his state, and in 1832 resigned rather than support nullification. He published *Fiesco*, a tragedy; *Carolina Sports by Land and Water*; and many political letters and essays.

• ELLIS, a co. in w. Kansas, drained by Saline and Smoky rivers, and crossed by the Kansas Pacific railroad; 900 sq.m.; pop. '78, 2,437. It is mostly prairie, and the soil is fertile. Co. seat, Hays City.

ELLIS, a co. in n.e. Texas, on Trinity river, intersected by the Houston and Texas Central railroad; 1100 sq.m.; pop. '70, 7,514—1506 colored. The surface is undulating, with plenty of timber; soil fertile, producing corn, cotton, wheat, etc. Co. seat, Waxahatchie.

ELLIS, GEORGE EDWARD, D.D.; b. Boston, 1814; graduate of Harvard and of Cambridge divinity school; in 1840, Unitarian pastor in Charlestown, Mass.; resigning in 1869; in 1857, professor of doctrinal theology in the Cambridge divinity school. In 1864, he delivered the Lowell lectures in the evidences of Christianity. He wrote lives of John Mason, Anne Hutchinson, and William Penn, for Spark's *American Biography*; and published the *Half Century of the Unitarian Controversy*; *The Aims and Purposes of the Founders of Massachusetts*; and various memoirs and biographies. For several years he was editor of the *Christian Examiner*.

ELLIS, WILLIAM, an English missionary and author. He was a poor boy with a scanty education, but bright and intelligent. When 20 years old, having come under deep religious impressions, he offered himself as a missionary to the London missionary society, and after spending a year in studying theology and acquiring several practical arts, such as printing and book-binding, he was sent to the South Sea islands in 1816, and reached his destination a year later. Here his labors were exceedingly fruitful, contributing much toward the great and beneficent changes that have taken place during the present century in that portion of the world. At the end of seven years he was compelled by the illness of his wife to return to England. The homeward voyage was made by way of the United States, where he spent several months in traveling and addressing missionary meetings, doing much thereby to arouse a missionary spirit in the American churches. On his arrival in his native land, he was appointed traveling agent of the London missionary society, whose principles and purposes he advocated in nearly every important town in Great Britain. While thus employed he published his *Tour through Hawaii*, which he had written while on the journey home; and also his *Polynesian Researches*, in two volumes, a work of much interest and value. In 1832, he was appointed foreign secretary of the society which he had so long served in other capacities, discharging the duties of the office with zeal and efficiency for seven years till ill-health compelled his resignation. During this period he had married his second wife, Miss Sarah Stickney, the well-known author, and published his *History of Madagascar*. After resting for a time in France, he took up his residence at Hoddesdon, Hertfordshire, where, in 1847, he became pastor of a small Congregational church. At length he was called by the London missionary society to visit Madagascar, to promote the resumption of the missionary enterprise there. The results of this agency are set forth in his *Three Visits to Madagascar*; one of the most romantic narratives in the whole literature of missions. He made a fourth visit to the island in 1863, of which an account will be found in his *Madagascar Revisited*. He also wrote and published *A Vindication of the South Sea Missions from the Misrepresentation of Otto von Kotzebue*; and *Village Lectures on Popery*. He was born in 1794; died in 1872.

ELLISTON, ROBERT WILLIAM, 1774-1831; b. London; appeared as an actor at Bath when 17 years old; and in London at 22, where he rose to a leading position. He was lessee of Drury Lane in 1819; afterwards of the Surrey theater. Elliston was considered the best comedian of his time.

ELLSWORTH, a co. in central Kansas, on Smoky river, crossed by the Kansas Pacific railroad; 720 sq.m.; pop. '78, 5,057. The surface is nearly all prairie, and the soil fertile, producing corn, wheat, etc. Co. seat, Ellsworth.

ELLSWORTH, a port of entry, city, and seat of justice of Hancock co., Me., on Union river near the sea, 28 m. s.e. of Bangor; pop. '70, 5,257. The chief occupations are lumbering, navigation, and fishing.

ELLSWORTH, EPHRAIM ELMER, b. N. Y., 1837; killed May 24, 1861, at Alexandria, Va. Before the rebellion he organized a company of zouaves, with which he traveled in different parts of the country, in the summer of 1860, winning great praise by the perfection of their drill. In April, 1861, he organized a zouave regiment from the volunteer firemen of New York city. His regiment took part in the first advance of the national forces from Washington into Virginia. Ellsworth, as they entered Alexandria, went into a hotel to take down a secession flag which was flying from its roof, and while coming out with it was met and shot dead by the landlord, who the next moment was also dead—killed by Ellsworth's soldiers.

ELLSWORTH, OLIVER, LL.D., 1745-1807; b. Conn.; graduated at the college of New Jersey in 1766, and began the practice of law at Hartford. He was a member of the Connecticut general assembly, and in 1777, a delegate to Congress. From 1780 to 1784, he was a member of the council of Connecticut, and in the latter year was appointed judge of the superior court. In 1787, he was sent as a delegate to the convention which framed the first constitution of the United States. He was one of the first U. S. senators from Connecticut, and at the end of his term was nominated by Washington chief-

justice of the U. S. supreme court. After five years' service he resigned; but in the mean time he was sent to France as one of the commissioners to negotiate a treaty with that nation. Returning to Connecticut, he was chosen chief-justice of the supreme court, but declined to accept the place.

ELLSWORTH, WILLIAM WOLCOTT, LL.D.; 1791-1868; son of Oliver; b. Conn.; graduate of Yale, and professor of law in Trinity college. He was judge of the supreme court of the state from 1847 to 1861, a member of congress in 1829, and governor of Connecticut 1838-42.

ELLWANGEN, a t. in Württemberg, 55 m. n.e. of Stuttgart; a place of considerable importance in manufacturing; pop. '70, 4,155. It is the seat of government of the circle of Jaxt.

ELLWOOD, THOMAS, 1639-1713; an English author noted for his intimacy with Milton, whom he met through an introduction by a Quaker family, and to whom he became reader of Latin. Ellwood had become a Quaker, to his father's great disgust, and with the result of bringing upon himself much persecution. Milton gave Ellwood the manuscript of *Paradise Lost* to read, and asked his opinion of it. In returning it, Ellwood suggested *Paradise Found* as a subject; and this, as Milton long afterward said, suggested to his mind the supplementary poem of *Paradise Regained*. It may be the general opinion that it would have been as well for the great poet if Ellwood had kept his idea to himself. Ellwood was the author of a number of polemical works, among them *Forgery no Christianity*; *The Foundation of Tithes Shaken*; and *Sacred Histories of the Old and New Testaments*.

ELMIRA, (ante), a city and seat of justice of Chemung co., N. Y., on the Chemung river and canal, and the Erie, the Northern Central, the Tioga and Elmira State Line, and the Utica, Ithaca, and Elmira railroads; pop. '75, 20,436. In the city are a college for women, a free academy, a Roman Catholic academy, the New York state reformatory institution, and a large number of manufactories of railroad machinery, farming implements, tools, etc. It has a beautiful park of 300 acres, street railways, and water works. Its growth has been both rapid and substantial. The region around it is very fertile, and the city has an extensive trade. In the war of the rebellion it was made a great recruiting station, and was also the site of a military prison. The place was settled in 1790 and chartered as a city in 1864.

ELMORE, a co. in central Alabama, intersected by the Coosa and bounded by the Tallapoosa river, and crossed by the Eufaula and Montgomery railroads; 775 sq. m.; pop. '80, 17,674—8,861 colored. The surface is undulating, and the soil fertile; the productions are wheat, corn, and cotton. Co. seat, Wetumpka.

ELOQUENCE is the oral or written expression of thoughts and truths in a manner adapted to convince or persuade hearers or readers, and excite them to corresponding action. In its highest form it is inspired by an earnest love of truth and right, and a hearty scorn for whatever is base and false. An unrighteous cause may be defended with consummate skill, but not eloquently in the best sense of the word. The finest examples of eloquence—those which, through generations, have kept their place in the world's admiration, and which time can never destroy—are the utterances of men devoted to the truth and to the welfare of the human race. Emerson used to say that eloquence was "dog-cheap" in the antislavery meetings; if so, it must have been because those who spoke were inspired by a love of human freedom, and were conscious that they had a great and just cause. The great orators of antiquity were Demosthenes and Cicero. England in modern times has had her Pitt, Burke, Fox, and Sheridan, and now has her Gladstone and Bright. Ireland has a long line of men whose eloquence has moved the heart of nations, among them Grattan, Phillips, and O'Connell. In many of the European nations the growth of eloquence has been checked by causes originating in their political institutions and social habits. Among the names of great orators in France, that of Mirabeau is the most conspicuous. In the records of pulpit eloquence France presents among others the names of Bossuet, Massillon, Lacordaire, Lamennais, and Hyacinthe. The history of the United States is illustrated by eloquence at every step. James Otis, Fisher Ames, and Patrick Henry are names belonging to the period of the revolution. Since that day we have had Webster, Clay, Calhoun, Wirt, and Choate. In pulpit eloquence the country has been and is still rich. Among many eminent names in this department may be mentioned Samuel Davies, John Mason, Lyman Beecher, William Ellery Channing, Orville Dewey, Edwin H. Chapin, Henry Ward Beecher, Stephen H. Tyng, sr., and Richard S. Storrs.

EL PASO, a co. in central Colorado, on the head-waters of the Arkansas river, intersected by the Denver and Rio Grande railroad; 2,800 sq. m.; pop. '70, 987. The surface is rough and the soil fertile; productions chiefly agricultural. Pike's Peak, so long known as a guide-post for travelers over the plains, is one of its features. Co. seat, Colorado Springs.

EL PASO, the extreme w. co. of Texas, on the Rio Grande, and the New Mexico border; 9,450 sq. m.; pop. '80, 3,845—247 colored. Nearly the whole of the co. is sandy and barren, but there is some moderately good soil along the valley of the Rio Grande. Co. seat, El Paso.

ELPHINSTONE, The Honorable MOUNTSTUART, 1779-1859. an English statesman. He was sent when but 17 years old by the East India company to Calcutta, became assistant to the British resident at Poonah in 1801, and later to sir Arthur Wellesley, to whom he acted as aid on the outbreak of war, and after the war was appointed resident at Nagpore. In 1808, he was envoy to the Afghan capital, Cabul, and in 1811 resident at Poonah. On the renewal of hostilities in 1817, he assumed command of the English troops during the battle of Kirkee, and contributed largely to their success. He subsequently governed the conquered districts with remarkable force and consideration, preserving the native customs and rights, so as to win the regard of his subjects, and strengthen British rule. In 1820-27, he was lieutenant-governor of Bombay, and drew up the Elphinstone code. He is regarded as the founder of state education in India. He was twice offered the governor-generalship of India, but declined. His last 30 years were devoted to study and authorship. He wrote *An Account of the Kingdom of Cabul and its Dependencies in Persia and India*, and a *History of India*. Both are standard authorities.

ELSASS AND ELSSASS-LOTHRINGEN. See **ALSACE**, *ante*.

ELUTRIATION (from a Latin word meaning "to cleanse"), an operation for preparing clay for porcelain manufacture, and for glazing earthenware, and for other purposes. Different forms of apparatus are used; some employ vats containing grinding wheels, others only wheels for stirring; but a simple deep vat or hogshead will answer the purpose on a small scale, the stirring being done by hand, with a rod or paddle. The earth or clay being mingled with sufficient water to make it quite thin, is stirred and allowed to stand, till the coarser particles are precipitated. The finer particles, suspended in the water, may then be drawn off (a siphon may be used with advantage), and after they have subsided, may be collected. The process for filtering water in reservoirs supplying cities by which it is made to pass over and under diaphragms, so that both light and heavy impurities are separated, is a process of filtration by elutriation. Elutriation on a grand scale is exhibited by nature in the deposit of fine earths. The immense beds of fine potter's clay and kaolin covering many square miles in area, are the result of the slow subsidence of fine particles suspended in water passing in a slow but steady current in estuaries. The streams from the land carry down the turbid products of rain, depositing at first coarse gravel, then finer gravel, then coarse and fine sand, all the particles pursuing an oblique descent, more and more approaching the horizontal, till at last the impalpable particles of fine clay are slowly deposited over vast areas.

ELYMAIS, an ancient province on the Persian gulf, supposed to have been a district of Elam (q.v.), though the name is sometimes used as equivalent to Elam.

ELYRIA, the seat of justice of Loraine co., Ohio, on Black river, 7 m. s. of lake Erie, on the Lake Shore and Michigan Southern railroad, at the junction of the Sandusky and Norwalk divisions, and the crossing of the Lake Shore and Tuscarawas Valley railroads; pop. '70, 3,038. There is water-power furnished by Black river, and a number of important manufactories.

EMANCIPATION, PROCLAMATION OF. The document issued by Abraham Lincoln, president of the United States, Jan. 1, 1863, declaring the immediate freedom of the great majority of the slaves in the United States, and striking a death-blow at the whole system of American slavery in this country, for the purpose of putting an end to the rebellion then existing in the slave states and restoring the union on the basis of equal liberty for all men. For a long time president Lincoln hesitated, on constitutional grounds, to take this step, which he held to be within the power of the executive only as a measure of war. At length, however, a crisis arrived when he felt it to be not only a right but a duty to destroy the institution in which the rebellion had its roots, and which had long been the great embarrassment and opprobrium of the republic. The document, in view of its purposes and effects, must ever hold an important place in the national annals.

PROCLAMATION.

Whereas, On the 22d day of Sept., in the year of our Lord 1862, a proclamation was issued by the president of the United States, containing among other things the following, to wit:

That, on 1st day of Jan., in the year of our Lord 1863, all persons held as slaves within any state, or any designated part of a state, the people whereof shall then be in rebellion against the United States, shall be thenceforward and forever free, and the executive government of the United States, including the military and naval authority thereof, will recognize and maintain the freedom of such persons, and will do no act or acts to repress such persons, or any of them, in any efforts they may make for their actual freedom:

That, the executive will, on the 1st day of Jan. aforesaid, by proclamation, designate the states and parts of states, if any, in which the people thereof respectively shall then be in rebellion against the United States, and the fact that any State, or the people thereof, shall on that day be in good faith represented in the congress of the United States by members chosen thereto at elections wherein a majority of the qualified voters

of such state shall have participated, shall, in the absence of strong countervailing testimony, be deemed conclusive evidence that such state and the people thereof are not then in rebellion against the United States:

Now, therefore, I, Abraham Lincoln, president of the United States, by virtue of the power in me vested as commander-in-chief of the army and navy of the United States, in time of actual armed rebellion against the authority and government of the United States, and as a fit and necessary war-measure for repressing said rebellion, do, on this 1st day of Jan., in the year of our Lord 1863, and in accordance with my purpose so to do, publicly proclaim for the full period of 100 days from the day of the first above-mentioned order, and designate as the states and parts of states wherein the people thereof respectively are this day in rebellion against the United States, the following, to wit: Arkansas, Texas, Louisiana, except the parishes of St. Bernard, Plaquemines, Jefferson, St. John, St. Charles, St. James, Ascension, Assumption, Terre Bonne, Lafourche, St. Mary, St. Martin, and Orleans, including the city of New Orleans, Mississippi, Alabama, Florida, Georgia, South Carolina, North Carolina, and Virginia, except the 48 counties designated as West Virginia, and also the counties of Berkeley, Accomac, Northampton, Elizabeth City, York, Princess Ann, and Norfolk, including the cities of Norfolk and Portsmouth, and which excepted parts are, for the present, left precisely as if this proclamation were not issued.

And by virtue of the power and for the purpose aforesaid, I do order and declare that all persons held as slaves within said designated states and parts of states are, and henceforward shall be, free; and that the executive government of the United States, including the military and naval authorities thereof, will recognize and maintain the freedom of said persons.

And I hereby enjoin upon the people so declared to be free, to abstain from all violence, unless in necessary self-defense, and I recommend to them, that in all cases, when allowed, they labor faithfully for reasonable wages.

And I further declare and make known that such persons of suitable condition will be received into the armed service of the United States to garrison forts, positions, stations, and other places, and to man vessels of all sorts in said service.

And upon this, sincerely believed to be an act of justice, warranted by the constitution, upon military necessity, I invoke the considerate judgment of mankind and the gracious favor of Almighty God.

In witness whereof, I have hereunto set my hand and caused the seal of the United States to be affixed.

[L.s.] Done at the city of Washington, this 1st day of Jan., in the year of our Lord 1863, and of the independence of the United States of America the 87th.

By the president:

ABRAHAM LINCOLN.

WILLIAM H. SEWARD, secretary of state.

The work of emancipation in the United States was completed at the adoption of article XIII. of the amendments to the constitution, and the reconstruction of the states in rebellion upon that basis. (See *SLAVERY, ante*).

EMANUEL, a co. in e. central Georgia, s.e. of Ogeechee river; 950 sq.m.; pop. '70, 6,134—1703 colored. The surface is level and largely covered with pine forests; soil sandy, and not very productive. Cotton, corn, and pork are produced. Co. seat, Swainsborough.

EMBEZZLEMENT (*ante*), in criminal law, consists in fraudulently removing and secreting personal property, with which the party has been intrusted, for the purpose of applying it to his own use. It differs from larceny, which is "the felonious taking and carrying away the personal property of another" by one who has not a legal possession thereof. The moral guilt of embezzlement is often greater than that of larceny, and the laws against it are, therefore, justly severe. This offense has, for some time past, been of very frequent occurrence in this country, many men of previously eminent standing for integrity having been detected in committing it. Trustees and other officers of charitable societies are guilty of embezzlement when they misappropriate the funds committed to their charge.

EMBLA, in Norse mythology, the first woman created. When the gods Odin, Hœnir, and Lodur left their home to wander on the earth, they found Ask and Embla (ash and elm) without power and without destiny; spirits they had not, nor sense, nor blood, nor power of motion, nor fair color. Odin gave them spirit, Hœnir sense, and Lodur blood and fair color. Some have it the gods were Odin, Veli, and Ve. The man they called Ask and the woman Embla. From this pair the human race descended; a dwelling was assigned to them in Midgard (the earth).

EMBURY, EMMA CATHERINE, 1806-63; b. New York; daughter of Dr. James R. Manley. She has published many poems and prose sketches and tales, among them *Guido and Other Poems*; *Constance Latimer, or the Blind Girl, and other Tales*; *Pictures of Early Life*; *Glimpses of Home Life*; *Nature's Gems, or American Wild Flowers*; *Love's Taken Flowers*; *The Waldorf Family, etc.*

EMBURY, PHILIP, b. Ireland, 1728; d. Troy, N. Y., 1775; widely known as the "founder of American Methodism." He was of German descent, and came to America

in 1760. In 1766, he organized a society in New York, and the next year began to preach in a rigging loft, which place became famous as the cradle of Methodism in this country. The next year a church was built, on the site of the present old John street church, partly by E.'s own hands. About a year later a company of missionaries sent out by Wesley arrived in New York, and Embury went as a missionary to the region around Albany and Troy. He died suddenly from an accident.

EMERALD BIRD OF PARADISE, a native of New Guinea, and one of the most beautiful of its order. The skins and feathers are highly prized for ornament, and bring large prices.

EMERSON, GEORGE BARRELL, LL.D., b. Maine, 1797; graduate of Harvard, where he was afterwards tutor in mathematics and natural philosophy. He was a popular teacher in Boston until his retirement from professional life in 1855. He has published a second part to *School and School Master*; a *Manual of Architecture*; *Report on the Trees and Shrubs growing naturally in the Forests of Massachusetts*, etc. He has been president of the Boston society of natural history, and was chairman of the commission for the zoological and botanical survey of the state.

EMERSON, RALPH WALDO, LL.D. (*ante*); an eminent American poet and essayist, b. Boston, May 25, 1803. He is of a clerical lineage, being the eighth in succession of a consecutive line of Puritan ministers. His father, who died when he was but seven years of age, was the Rev. William Emerson of the First church in Boston. He was fitted for college in the Boston public Latin school, entered Harvard in 1817, and graduated in 1821. His tastes were literary rather than scholastic. In the Latin school he wrote verses for exhibition days, and in college the library had for him more charms than the text-books. His rank as a student was not above that of some others in his class, though he took two prizes for dissertations and one for declamation, and was the class-day poet at the time of his graduation. For five years after leaving college he was engaged with his brother William in teaching a successful school for girls in Boston. During this time he must have given attention to theological studies, for he was "appropriated to preach" in 1826. After this, for the benefit of his health, he passed a winter in South Carolina and Florida. In Mar., 1829 he was ordained as colleague of the Rev. Henry Ware in the Second Unitarian church in Boston. His pastorate was short, for he soon found himself entertaining scruples concerning the ordinances of the church, and especially unwilling to administer that of the Lord's Supper. His resignation of his pulpit and of the ministry for such a reason made no little stir in the Unitarian denomination, and in the other Christian sects, being regarded as a very strange event. The parting between him and his congregation, in 1832, was most honorable and affectionate on both sides, for, as a preacher, he had won popularity and favor. He now went to Europe for a year, and on his return, in the winter of 1833-34, he began in Boston his eminent career as a lecturer, with a discourse upon "Water," before the Boston manufacturers' institute. Three other lectures, two upon "Italy," and one on "The Relation of Man to the Globe," were delivered during the same season. Shortly after this he delivered in Boston a course of biographical lectures on Michael Angelo, Milton, Luther, George Fox, and Edmund Burke; the first two of which appeared afterwards in the *North American Review*. Since that day, until within a few years past, he has been among the most conspicuous and popular of American lecturers, traveling extensively in the eastern, northern, and western states, and attracting large audiences, less by any oratorical gifts than by the solid value of his thoughts. In some places he has been a great favorite, speaking by invitation for the fortieth or fiftieth time in the same lyceum course, with undiminished interest. In 1835, Emerson took up his residence in Concord, Mass., where he still remains, the foremost citizen in the place, sharing the love, honor, and reverence of all the people, without distinction of party or sect. In 1835, and the three or four following years, he delivered in Boston successive courses of lectures on English literature, the philosophy of history, human culture, human life, and the times. In 1834, he delivered a poem before the Phi Beta Kappa society of Harvard; in 1837, an oration before the same society upon "The American Scholar;" and in 1838, an address to the senior class of the Cambridge divinity school, which created no little stir in the literary and theological world. His first book, a thin volume entitled *Nature*, appeared in 1836, and was received by a few enthusiastic admirers as opening a new era in American thought, while in some quarters it was sharply criticised. In 1841, appeared *The Method of Nature*, which developed more fully the peculiar qualities of his mind and his ways of thinking, and by its freshness and beauty won him many admirers. For reasons which to many leaders of popular thought were incomprehensible, he was rapidly gaining a strong hold upon the affection and reverence of an increasing multitude of his countrymen, and winning the attention of thoughtful men on the other side of the Atlantic. The "transcendental" movement, so called, was coincident with the appearance of his earliest works, and received from them both impulse and direction. In 1840, appeared a quarterly magazine entitled *The Dial*, with Miss Margaret Fuller as editor, assisted by A. Bronson Alcott, William H. Channing, Emerson, Theodore Parker, George Ripley, and others. This periodical was continued four years, during the last two of which Emerson was the editor. Two volumes of *Essays* were Emerson's next issues, the first appearing in 1841, the second in 1844. His collected

Poems were published in 1846. In 1847, he visited England to fulfill engagements as a lecturer, and was warmly received by the lovers of his books, and by the public generally. In 1849, he collected into a volume of *Miscellanies* his "Nature," and nine lectures and college addresses, which had previously appeared in *The Dial*, or in pamphlet form. In 1850, appeared his *Essays on Representative Men*, a work of great interest and power. In 1852, he assisted in preparing the memoirs of Margaret Fuller Ossoli. In 1856, he published *English Traits*, a work which well illustrated his powers of accurate observation, and his clear understanding of the workings of human nature under various conditions. Next appeared, in 1860, *The Conduct of Life*, a work which brings clearly to view the exalted moral and ethical principles which underlie and pervade all that he has written. A subsequent volume embraced a portion of his contributions to the *Atlantic Monthly*. In 1867, appeared a volume of his poems, *May Day and Other Pieces*. In 1870, he published *Society and Solitude*, and in 1869, appeared his *Prose Works Complete*. In 1875, he published four series of *Essays*. In 1878, in the *North American Review*, appeared a paper, *Sovereignty of Ethics*, which fixed the public attention as the ripest fruit of his broad culture; and in 1880, the *Unitarian Review* published, under the title of "The Preacher," his address of 1879 in the divinity chapel at Cambridge. He is now, in a serene old age, reported as being engaged in revising for the press his remaining MSS., which will not probably see the light until after his death. In the midst of his literary labors Emerson has found time to manifest his interest in great public questions as they arose. Some of his letters upon passing events in the newspaper press have exerted a wide influence. While he was a pastor in Boston he opened his pulpit to an earnest protest against American slavery, and during the whole period of the antislavery agitation he constantly manifested his sympathy with those who sought to deliver the land from the curse of human bondage. In 1844, he gave emphatic expression to his views in an address delivered upon the 1st of Aug., the anniversary of emancipation in the British West Indies. Though not in the technical sense of the word a reformer, his habits and tastes being rather those of a scholar and man of letters, every earnest movement for the welfare of humanity has had his sympathy. He gave his name to the call issued in 1850 for the first convention ever held in Massachusetts to secure for women equal rights with men as citizens and voters. He is a member of the American academy of arts and sciences, of the American philosophical society, of the Massachusetts historical society, and a vice-president of the free religious association. He is also a member of the board of overseers of Harvard university, from which he received the degree of doctor of laws in 1866. His writings, though marked by an ethical and spiritual vitality of the highest order, are utterly devoid of system, and pervaded by a certain mystical quality, charming to some but bewildering to others. His intellectual gems are profusely sown throughout his pages according to no visible or conscious method, and with settings that seem quite accidental; but they glow with a genuine luster wherever found. To the arts and processes of the logician he pays no regard, evidently thinking that they tend to belittle, rather than exalt, the truth. He simply affirms what he believes, making his appeal at every step to the moral intuitions of the reader, in the faith that the "spirit of man is the candle of the Lord," with a power of illumination adapted to every emergency. His position is clearly indicated in a simple sentence from his address at the divinity school in 1838: "The assumption that the age of inspiration is past, that the Bible is closed, the fear of degrading the character of Jesus by representing him as a man, indicate with sufficient clearness the falsehood of our theology." His earlier writings are supposed by some to show a drift towards pantheism, but others repel this interpretation as unjust. Certainly he has never called himself a pantheist, and there is unquestionable evidence that whatever may have been his former speculations, that name cannot truly be applied to him now. His friend A. Bronson Alcott reports him as saying: "I do not care to classify myself with any painstaking accuracy with this sect or with that; but if I am to have any appellation at all of a religious kind, I prefer to be called a Christian theist. You must not leave out the word Christian, for to leave out that is to leave out everything." Confirmation of this is to be found in his latest publication, *The Preacher*, in which he says: "Unlovely, nay, frightful, is the solitude of the soul which is without God in the world. To see men pursuing in faith their varied action, warm-hearted, providing for their children, loving their friends, performing their promises—what are they to this chill, houseless, fatherless, aimless Cain, the man who hears only the sound of his own footsteps in God's resplendent creation?"

EMIGRATION (*ante*). See IMMIGRATION.

EMINENT DOMAIN, the original ownership retained by the state, by which land or other private property may be taken for public use or benefit. It is the highest and most exact idea of property remaining in the government, or in the aggregate body of the people in their sovereign capacity, giving the right to resume possession in the manner directed by law. If the proper authorities propose to open a street, or charter a railroad, or set apart land for a park, or for any lawful and reasonable purpose, and the owner of lands in the route or space desired refuse to sell or ask an unreasonable price, the state by eminent domain has the power of control, and process may be issued from a court having authority to compel the surrender of the property. The constitution of

the United States limits the exercise of this right to cases where the public good demands it, and requires compensation to those from whom the property is taken. These conditions are also named by many of the state constitutions.

EMMAN'UEL, EMANUEL, or IMMANUEL, a Hebrew name, whose signification—"God with us"—is not, by itself, proof that he to whom it would be given was divine. This and similar combinations of divine names were, and still are, in ordinary use among Jews. But the evangelist Matthew (i. 23) applies it in a special manner to the child Jesus; and the whole history of the nativity is in harmony with the special application. Some Christian interpreters consider that the reference (Is. vii. 14) to the birth of the Messiah is direct and exclusive. But the prophecy itself and the circumstances in which it was spoken evidently call for a speedy fulfillment according to the ordinary laws of nature, the virgin being one whom the prophet was commanded then to marry, and her son the child spoken of, under another name, in the eighth chapter. Yet, besides this, as many interpreters believe, the prophecy was designed to have a secondary and full accomplishment in the miraculous conception and birth of Jesus Christ from his virgin mother. This is proved not simply by Matthew's application of the prophecy and by the New Testament account of the nativity, but also by the whole subsequent exhibition of the character and work of Jesus in attestation of his claim to be the incarnate Son of God.

EMMET, ROBERT, 1788-1803; b. Dublin, a school-fellow and college-mate of Moore, the poet. Both were members of the historical society, and ardent champions of the cause of freedom for Ireland. In 1798, Emmet was expelled from the university on account of his connection with the United Irishmen. He went to the continent, where he remained until 1802; then returned secretly to Dublin and endeavored to plan a general revolution. July 23, 1803, he made an attempt to seize the arsenal and city of Dublin; but his mob of followers created scarcely a serious riot, flying in panic at the first firing by the police. Finding his revolution a miserable failure, Emmet hid himself in the Wicklow mountains, intending to escape to the continent, but he delayed long enough to have an interview with the daughter of Curran, the famous advocate, with whom he was in love, and this delay led to his arrest. He was tried for treason, convicted, and executed Sept. 20, 1803. His speech, on being asked why sentence should not be pronounced, has long been held up as a model of patriotic eloquence.

EMMET, THOMAS ADDIS, LL.D. 1764-1827; b. Cork; brother of Robert. He was educated in Trinity college, Dublin, and studied medicine in Edinburgh, and visited the medical schools of the continent. In 1788, he gave up medicine, and took to the study of law, being admitted to the Dublin bar in 1790. He was involved as counsel and as leader of the United Irishmen, and in Mar., 1798, he, with others, was arrested. He was kept a prisoner until June, 1802, and then received freedom on agreeing to leave the country. He went to Hamburg and to Brussels, and, in 1803, to France, where he had an interview with Napoleon, who was at that time contemplating an invasion of England. In 1804, he came to New York, where he soon gained a large law practice, and received much attention as a political exile. In 1812, he was attorney-general of New York state, but served only six months.

EMMETT, a co. in n. Iowa, on the border of Minnesota; 432 sq. m.; pop. '75, 1436. It is undulating, with fertile soil, and contains a number of small lakes. Co. seat, Estherville.

EMMETT, a co. in n. Michigan, in the peninsula bordering on Mackinaw straits and lake Michigan, traversed by the Grand Rapids and Indiana railroad; 430 sq. m.; pop. '74, 1272. The surface is undulating and the soil fertile, mostly of prairie; productions agricultural. Co. seat, Little Traverse.

EMMITTSBURG, or EMMETTSBURG, a village in Frederick co., Md., 61 m. n.w. of Baltimore, by the Western Maryland railroad, and 10 m. s.w. of Gettysburg, Penn. It is noted principally as the seat of Mount St. Mary's college, the largest Roman Catholic educational institution in the United States, established in 1808. Near by is St. Joseph's academy, the mother-house of the sisters of charity in this country. The village has about 800 inhabitants, besides students.

EMMONS, EBENEZER, 1799-1863; b. Mass.; professor of natural history in Williams college, 1833, and of chemistry in Albany medical college, 1838. In 1836, he was one of the commission to make a geological survey of New York, and in 1856, became state geologist of North Carolina. He wrote text books and reports on mineralogy and geology.

EMMONS, GEORGE F., b. Vt., 1811; midshipman 1828, and rose to rear-admiral in 1872. He was in the Wilkes exploring expedition, and off the Mexican coast during the war with that country. In the war of the rebellion he commanded blockading vessels, and was in Dahlgren's fleet; and from 1864 to the close of the war, he commanded a division of the blockading fleet in the gulf of Mexico.

EMMONS, NATHANIEL, D.D., was b. at East Haddam, Conn., in 1745, and graduated with honor at Yale college, in 1767. He began his theological studies with Rev. :

Nathan Strong, of Coventry, Conn., and continued them with Dr. John Smalley, of Berlin, Conn., who had been a pupil of Bellamy. In 1773, he was ordained pastor of the Congregational church in Franklin, Mass., and continued in the office 54 years. In this church, during and after his pastorate, he rejoiced over five revivals of religion, and received into communion about 400 persons who, almost without exception, were through life consistent Christians. He superintended the studies of nearly 100 young men in preparation for the ministry, many of whom became strong and useful preachers; some of them were distinguished as professors in colleges and theological seminaries; and about 50 have a place in published accounts of eminent men. He was one of the originators of the Mass. missionary society, and one of the editors of its missionary magazine from which the *Missionary Herald* grew. When masonry was popular he zealously opposed it; when the anti-slavery movement was denounced he actively favored it. He was a decided "Federalist," and caused great excitement by his political writings. As an author and preacher he exerted a very great influence on the churches. During his life he published 4 elaborate dissertations, more than 100 magazine articles, and about 200 sermons, of which 7,000 copies were issued. He preached about 6,000 times. At his death a part of his sermons was published in 7 octavo volumes, and a new edition, enlarged, in 6 volumes. About 75 years of his life were spent in earnest and systematic study, during the greater part of which time he read and wrote 10, 12, and sometimes 14 hours a day. He has been described by those who knew him well as "methodical, temperate, regular in his habits, distinguished for punctuality, precision and sharpness of mind, keen analysis, self-consistency, wit, frankness, honesty, and reverence for the truth. As a Calvinist he wished to be considered neither "high" nor "low," but consistent. On one Sabbath he would present the doctrine of divine sovereignty with such strength that some might think him a fatalist; the next Sabbath he would advocate free will so powerfully that some might call him a Pelagian; and in a third sermon he would lay out his strength in showing that the sovereignty of God was not inconsistent with the free-agency of man. He steadily adhered to old usages and wore the antique dress and three-cornered hat as long as he appeared in public. He lived to his 96th year, retaining the strength of his faculties to the last, and died with an unflinching faith in Christ.

EMORY, JOHN, D.D., 1789-1835; b. Md.; brought up to the law, but became a Methodist preacher in 1810. In 1820, he was a delegate to the British Wesleyan conference; in 1824, book agent of his church at New York, and in 1832, was chosen bishop. He wrote *The Divinity of Christ Vindicated; Defense of our Fathers*; and other works on religious subjects.

EMORY, ROBERT, D.D., 1814-48; son of John; president of Dickinson college; author of a life of his father, and *History of the Discipline of the Methodist Episcopal Church*.

EMORY, WILLIAM H., b. Md., 1811; a graduate of West Point; in 1863, col. of cavalry, and in 1865, maj.gen. of volunteers. He served with credit in the war of the rebellion.

EMPIRE, EMPEROR (*ante*), denotes the territory and people whose sovereign bears the title of emperor or empress; a title which, since the time of Julius Caesar, implies the possession of monarchial power in its highest form. During the middle ages and until a comparatively recent period the "Empire" in its strictest sense meant the "holy Roman empire" founded by Caesar and Augustus, the last remnant of which was lost in 1806, when Francis II. of Hapsburg, archduke of Austria and king of Hungary and Bohemia, resigned his inherited imperial title and assumed that of emperor of Austria alone. The Roman empire, from A.D. 395, was divided into two parts, one of which was ruled from Rome, the other from Constantinople. In theory, however, the two were held to be parts of one empire, divided only for greater convenience of administration. This was fiction rather than fact, for the two parts were in perpetual conflict. An attempt to restore the unity of the two under Charlemagne, who in 800 was crowned emperor at Rome by pope Leo III., proved abortive. Two hostile lines of emperors arose, each claiming to be the one true succession from Augustus and Constantine. The imperial title fell low, until it was revived in the w. in 962 by Otto the great, from whose time there was an unbroken succession of German kings, who assumed the rank and right of emperors and were acknowledged as such by the church. Their power, however, did not extend beyond Germany and northern Italy, and it was hampered by many restrictions, which were aggravated as time went on, until after the peace of Westphalia, in 1648, when the empire was reduced to a mere federation of principalities and the imperial title became little better than a farce. The eastern empire was overthrown in 1453, when Constantinople was taken by the Turks. The empires now existing are those of Austria, Russia, Germany, Turkey, China, and Japan. The queen of England bears the title of empress of India.

EMSER, HIERONYMUS, 1477-1527; a Roman Catholic theologian of Germany, distinguished as an opponent of Martin Luther. His most notable exploit was the publishing of a translation of the New Testament which he claimed as his own work, though it was really a reprint of Luther's translation with some slight alterations.

ENALIOSAURIANS (Gr. marine lizard), an order of fossil marine saurians commencing in the carboniferous, and ending in the cretaceous periods, being most abundant in the jurassic. They have biconcave vertebræ, like those of fishes, teeth like those of crocodiles, a lizard body, and the paddles of cetaceans instead of true feet, an apparently incompatible combination. Some had long snake-like necks, and most of them were of great size, and must have been exceedingly voracious. They comprise two groups, the ichthyosaurians and simosaurians. The ichthyosaurians belong to the jurassic and cretaceous formations, while the simosaurians have been found only in the triassic. The two principal genera of the ichthyosaurians are the ichthyosaurus and the plesiosaurus, and they are the most generally known. See **ICHTHYOSAURUS** and **PLESIOSAURUS**, *ante*.

ENCINA, or **ENZINA**, **JUAN DEL**, 1468-1534; the father of the Spanish drama, educated at Salamanca. About the close of the century he began to exhibit dramas of his own construction, in which he sometimes played low comedy parts. Early in the 16th c. he went to Rome and joined the priesthood. He visited Jerusalem, and published an account of his journey. His dramatic works mark the transition from the purely religious to the secular stage.

ENCRATITES, the name of early ascetics in the Christian church, who forbade marriage, the eating of the flesh of animals, and the use of wine, going so far as to substitute water for wine in the eucharist.

ENCRINAL or **ENCRINITAL LIMESTONE**, a limestone largely composed of the remains of crinoids. There are large beds in the Hamilton and Helderberg groups in New York state.

ENCUMBRANCE. See **INCUMBRANCES**, *ante*.

ENDICOTT, JOHN, 1589-1665; b. England. He was sent out by the Massachusetts company in 1628, to oversee the plantation at Salem. He was deputy-governor of Massachusetts for five years, and governor in 1644-49, 1651-54, and 1655-65. He was a rigid puritan, zealous and intolerant in administration after the fashion of those times. While he was governor, four Quakers were executed for defying the law which banished them from the colony on penalty of death if they should return.

ENDLESS SCREW, a screw combined with a cog-wheel, or one acting on the threads of a "female" screw sunk in the edge of a wheel. When the axis of the screw is at right angles to the plane of the wheel—that is, when the screw acts on a spur wheel—it is known as the American form.

ENDOCHROME (Gr. *endon*, and *chroma*, interior color), the coloring matter contained in the tissues of the lower classes of plants. It is a modification of chlorophyll, which gives the green color to the leaves of the higher classes of plants; when the chlorophyll changes its color in the autumn, in consequence, probably, of the retention of the oxygen element of carbonic acid, it is then not strictly chlorophyll, and may be called endochrome. Some chemists say that endochrome and chlorophyll have the same constitution, but it must be remembered that chlorophyll changes in accordance with the action of light.

ENDOWED SCHOOLS ACTS. The restrictions placed upon the endowed schools of England, both those of royal and private foundation, in regard to terms of admission, course of study, etc., were found inconvenient and injurious to the schools, and the power of parliament was invoked to make certain needful changes; and during the present reign several statutes have been enacted for this purpose. The act 3 and 4 Vict. c. 77 empowered courts of equity to make decrees or orders extending the systems of instructions and the right of admission to any school, and to establish schemes for the application of its resources, having due regard to the intentions of the founder. The act 23 Vict. c. 11 required the trustees and governors of endowed schools to make such order as, without interfering with the religious teaching of the other scholars or authorizing any new religious teaching, should admit children of other denominations than that to which the foundation belongs, except where the foundation expressly requires the children to be instructed according to the formularies of such denomination. The most important public schools—Eton, Harrow, Westminster, etc.—were exempted from the operations of these acts. Another act annexed certain conditions to the appointment of officers in endowed schools. The act of 1869 is most important of all. It authorizes the appointment of commissioners, "with power in such manner as may render any educational endowment (with certain specified exceptions) most conducive to the education of boys and girls, and either of them, to alter and add to any existing, and to make new trusts, directions, and provisions which affect such endowment and the education promoted thereby." A subsequent act continues and amends the act of 1869, and one still later transfers the power of the endowed schools commissioners to the charity commissioners.

ENFIELD, a village in Hartford co., Conn., near the Connecticut river, and the New York, New Haven and Hartford railroad, 14 m. n. of Hartford; pop. of township, '70, 6,324. There are carpet factories and extensive powder-mills in the village, the latter

said to be the largest in the world. In the town are two or three manufacturing villages, and a community of Shakers.

ENFIELD, a t. in Middlesex, England, 10 m. n.e. of London, noted as the place of manufacture of the Enfield rifle, now the Martini-Henry rifle; pop. '71, 16,054. In the place are the remains of a royal palace in which Edward VI. kept his court.

ENFIELD, WILLIAM, LL.D., 1741-97; an English dissenting preacher; minister in Liverpool in 1763, and subsequently in various other places. Besides many sermons, he published the *Preacher's Directory*; the *English Preacher*; *Institutes of Natural Philosophy, Theoretical and Experimental*; and articles in Aiken's *Biographical Dictionary*.

ENG AND CHANG. See SIAMESE TWINS (*ante*).

EN-GEDI (meaning in Hebrew "the fountain of the kid," and corresponding to the Arabic "Ain-Jidy") is the name of a wilderness, a mountain pass, a ruined village, and a perennial fountain on the w. side of the Dead sea, half way between its northern and southern ends. In the days of Abraham it was the site of a city named Hazezon-tamar, *cutting of palm trees*, doubtless with reference to the grove of trees which then grew around the fountain. In its strongholds was the home of the Amorites, who were, at that time, attacked and destroyed by the Assyrians and their allies. Here in "the city of palm-trees," at the time of the exodus from Egypt, a branch of the Kenites lived concerning whom Balaam said—"Strong is thy dwelling place, and thou puttest thy nest in the rock." After the conquest of Canaan they left this fortress and went up to dwell with the tribe of Judah. Four hundred years later, David fled for refuge into the strongholds of En-gedi. When Saul heard this he "took 3,000 chosen men and went to seek David and his men on the rocks of the wild goats." Entering one of the numerous caverns, it proved to be the very one in the sides of which the fugitives were concealed. David, refusing to lift his hand against the king, and forbidding his followers to touch him, cut off the skirt of his robe, as proof of what he might have done, and let him depart. After David, Solomon celebrated in his "song of songs" the vineyards of En-gedi, which, as the ruins still show, were planted all along the terraced side of the mountain. About 1000 years later the Jewish sect of the Essenes, in their progressive efforts to isolate themselves from all the impurities of life, chose at last as their retreat the absolute solitude of the caverns around the fountain of En-gedi. Four hundred years afterwards there was a large village on the coast below the fountain, the ruins of which yet remain. And 1400 years later still (A.D. 1838), two American travelers on their way to the Dead sea, descending the mountain by a terrific pass, more difficult and dangerous than the heights of Lebanon or of the Alps, in zigzag directions, at very steep angles, over rock as smooth as glass but of irregular surface, first along ledges on the perpendicular face of the cliff, and then down the precipitous sides, came at length to the beautiful fountain, bursting forth a fine stream on a narrow shelf of rock and rushing down the steep descent of 400 ft. into the sea in a course hidden from view by the luxuriant thicket of trees and shrubs with which its waters have clothed the rocks. And on the rocks the wild goats still roamed, secure as they had done 3,700 years before, when the fountain was named.

ENGELBERT, SAINT, 1185-1225; in 1215, elector of the empire and archbishop of Cologne. He was regent in Germany while the emperor Frederiek II. visited Italy. He reformed the clergy, aggrandized the church, and curbed the power of the nobles. Engelbert was murdered by his nephew, count von Isenberg, who was broken on the wheel, and his fellow conspirators, the bishops of Münster and Osnabrück, were excommunicated.

ENGINEERS, CORPS OF, organized in the United States in 1802, to consist of one col., one lieut.col., two majors, four captains, four first and second lieutenants, and cadets—the whole number not to exceed 20—to be stationed at West Point, and to constitute a military academy. In 1838, the corps was increased to 47 officers, and a corps of topographical engineers in addition was organized. In 1846, sappers, miners, and pontoniers (bridge builders) were added. In 1861, on the beginning of the rebellion, three additional companies were provided for, and one of topographical engineers was added. This company was disbanded in 1863, and its officers sent to the corps of engineers. At present the corps has one chief, six colonels, 12 lieutenants, 24 majors, 30 captains, 26 first lieutenants, and 10 second lieutenants. The corps is a special arm of the service, charged with the selection and purchase of sites, and the constructing of fortifications; the examination and removal of obstructions in streams; with works of defense and attack at fixed places, besides important field duties in preparing for the movement of forces. The corps have also to plan and superintend harbor and river improvements; to make surveys and geographical explorations, etc. Until 1866, the engineer corps had the superintendence of the West Point academy, but since that year all branches of the service are admitted to their share of supervision.

ENGINEERS IN THE UNITED STATES NAVY, are commissioned officers having charge of the machinery of steam vessels. They must have a thorough practical education in the construction and management of steam machinery. In military law, they are considered non-combatants.

ENGLAND, JOHN, D.D., 1786-1842; b. Ireland, educated at Carlow college, and took orders in the Roman Catholic church. In 1820, he was appointed bishop of Charleston, S. C., where he founded the *Catholic Miscellany*, the first publication of that church in the United States. He was a learned and zealous prelate, efficient in his office, but kindly disposed towards those of other communions, and was held in general esteem.

ENGLE, FREDERICK, 1799-1868; b. Penn.; midshipman in 1814, rising to rear-admiral in 1836, when he was retired. He served with distinction in the Mexican war and in the war of the rebellion.

ENGLEWOOD, a village and township in Bergen co., N. J., 14 m. n. of New York, on the New Jersey Northern railroad, near the palisades. It is occupied chiefly by the families of men who do business in New York; has good hotels, several churches, and a classical institute. It is noted for fine scenery and cultivated society.

ENGLISH, GEORGE BETHUNE, 1787-1828; b. Mass.; graduated at Harvard, and was a member of the Boston bar, but finally studied divinity. He published *The Grounds of Christianity Examined*, a work favoring Jewish views. After editing a paper in the west, he became a lieutenant of marines, and went on service in the Mediterranean, resigned his commission, became a Mohammedan, joined the army of Ismail Pasha in 1820, and served in the artillery in the expedition against Sennaar. He was subsequently agent for the United States government in the Levant, returning home in 1827. He published *Narrative of the Expedition to Dongola and Sennaar*.

ENGLISH, THOMAS DUNN, b. Philadelphia, 1819; studied medicine and law, but soon devoted his whole attention to literature, editing newspapers and magazines, and writing novels, dramas, poems, etc. His song of *Ben Bolt* is widely known. Of late years he has been practicing as a physician, though still a frequent contributor to current literature.

ENGLISH, WILLIAM H., b. Ind., 1822. He studied law, and in 1843 was chosen clerk of the Indiana house of representatives. In 1851, he was made speaker of the legislature, and in 1853 was elected to congress, holding his seat till 1860, when he retired from active political life. His chief title to distinction, however, is his nomination for vice-president of the United States by the democratic national convention at Cincinnati, June, 1860.

ENGLISH PALE, or IRISH PALE, or THE PALE, a portion of Ireland brought under English rule before the complete subjugation of the whole island, corresponding nearly with the present province of Leinster, with the counties of Cork, Kerry, Waterford, Limerick, and Tipperary; but the boundaries varied at different times.

ENGRAFTING. See GRAFTING, *ante*.

ENGRAVING (*ante*). The 19th c. has produced most highly accomplished work in line engraving, both in figure and in landscape. Its characteristics, in comparison with the work of other centuries, are chiefly a more thorough and delicate rendering of local colors, light and shade, and texture. The older engravers could draw as correctly as the modern; but they either neglected these elements or admitted them sparingly, as opposed to the spirit of their art. If you look at a modern engraving from Landseer, you will see the blackness of a gentleman's boot (local color), the soft roughness of his coat (texture), and the exact value in light and dark of his face and costume against the cloudy sky. Nay, more, you will find every sparkle on bit, boot, and stirrup. Modern painting pays more attention to texture and *chiaroscuro* than classical painting did, so engraving has followed in the same directions; but there is a certain sameness in pure line engraving which is more favorable to some forms and textures than to others. This sameness of line engraving, and its costliness, have led to the adoption of mixed methods, which are extremely prevalent in modern commercial prints from popular artists. In the well-known prints from Rosa Bonheur, for example, by T. Landseer, H. T. Ryall, and C. G. Lewis, the tone of the sky is produced by machine-ruling, and so is much under tone in the landscape; the fur of the animals is all etched, and so are the foreground plants, the real burin work being used sparingly where most favorable to texture. Even in the exquisite engravings after Turner, by Cooke, Goodall, Wallis, Miller, Wilmore, and others, who reached a degree of delicacy in light and shade far surpassing the work of the old masters, the engravers have recourse to etching, finishing with the burin and dry-point. Turner's name may be added to those of Raphael, Rubens, and Claude in the list of painters who have had a special influence upon engraving. The specialty of Turner's influence was in the direction of delicacy of tone. In this respect the Turner vignettes to Rogers' poems were a high-water mark of human attainment, not likely to be surpassed.

Pure line engraving is still practiced by a few artists in England and France. In France, the lovers of line engraving have endeavored to keep it alive by organizing themselves into a society for its encouragement. The most recent direction of the art, in the works of Ferdinand Gaillard, is a return to studied outline, but in combination with the most elaborate modeling. In his "St. Sebastian" the outline is studied and marked with careful firmness throughout, and the modeling is thoroughly worked out

in minute touches and fine lines, giving powerful relief without any but the most delicate chiaroscuro.

To prepare a plate for etching, it is first covered with etching-ground, a composition which resists acid. A ground is to be of a quality so adhesive that it will not quit the copper when a small quantity is left isolated between the lines, yet not so adhesive that the etching point cannot easily and entirely remove it; at the same time a good ground will be hard enough to bear the hand upon it, or a sheet of paper, yet not so hard as to be brittle. The plate being grounded, its back and edges are protected from the acid by Japan varnish, which soon dries; then the drawing is traced upon it. The best way of tracing a drawing is to use sheet gelatine, which is employed as follows: The gelatine is laid upon the drawing, which its transparency allows you to see perfectly, and you trace the lines by scratching the smooth surface with a sharp point. You then fill these scratches with fine black-lead in powder, rubbing it in with the finger; turn the tracing with its face to the plate, and rub the back of it with a burnisher. The black-lead from the scratches adheres to the etching-ground, and shows upon it as pale gray, much more visible than anything else which you can use for tracing. Then comes the work of the etching-needle, which is merely a piece of steel sharpened more or less. Turner used a prong of an old steel fork, which did as well as anything; but neater etching-needles are sold by artists' color-makers. The needle removes the acid and lays the copper bare. Some artists sharpen their needles so as to present a cutting edge, which, when used sideways, scrapes away a broad line; and many etchers use needles of various degrees of sharpness to get thicker or thinner lines. It may be well to observe, in connection with this part of the subject, that while thick lines agree perfectly well with the nature of wood-cut, they are very apt to give an unpleasant heaviness to plate engraving of all kinds, whilst thin lines have generally a clear and agreeable appearance in plate engraving. Nevertheless, lines of moderate thickness are used effectively in etching when covered with fine shading, and very thick lines indeed were employed with good results by Turner when he intended to cover them with mezzotint and to print in brown ink, because their thickness was essential to prevent them from being overwhelmed by the mezzotint, and the brown ink made them print less heavily than the black. Etchers differ in opinion as to whether the needle ought to scratch the copper or simply to glide upon its surface. A gliding needle is much more free, and therefore communicates a greater appearance of freedom to the etching; but it has the inconvenience that the etching-ground may not always be entirely removed, and then the lines may be defective from insufficient biting. A scratch needle, on the other hand, is free from this serious inconvenience; but it must not scratch irregularly so as to engrave lines of various depth. The biting in former times was generally done with a mixture of nitrous acid and water, in equal proportions; but in the present day a Dutch mordant is much used, which is composed as follows: Hydrochloric acid, 100 grammes; chlorate of potash, 20 grammes; water, 880 grammes. To make it, heat the water, add the chlorate of potash, wait until it is entirely dissolved, then add the acid. The nitrous mordant acts rapidly, and causes ebullition; the Dutch mordant acts slowly, and causes no ebullition. The nitrous mordant widens the lines; the Dutch mordant bites in depth, and does not widen the lines to any perceptible degree. The time required for both depends upon temperature. A mordant bites slowly when cold, and more and more rapidly when heated. To obviate irregularity caused by difference of temperature, a good plan is to heat the Dutch mordant artificially to 95° F. by lamps under the bath, for which a photographer's porcelain tray is most convenient, and to keep it steadily to that temperature; the result may be counted upon; but whatever the temperature fixed upon, the result will be regular if the temperature be regular. To get different degrees of biting on the same plate, the lines which are to be pale are "stopped out" by being painted over with Japan varnish, or with etching-ground dissolved in oil of lavender, the darkest lines being reserved to the last, as they have to bite longest. When the acid has done its work properly, the lines are bitten in such various degrees of depth that they will print with the degree of blackness required; but if some parts of the subject require to be made paler, they can be lowered by rubbing them with charcoal and olive oil, and if they have to be made deeper, they can be re-bitten or covered with added shading. Re-biting is done with the roller above mentioned, which is now charged very lightly with paste, and rolled over the copper with no pressure but its own weight, so as to cover the smooth surface, but not to fill up any of the lines. The oil of lavender is then expelled as before by gently heating the plate, but it is not smoked. The lines which require re-biting may now be re-bitten, and the others preserved against the action of the acid by stopping out. These are a few of the most essential technical points in etching, but there are many matters of detail for which the reader is referred to the special works on the subject. During the last twenty years there has been a great revival of etching as an independent art. The comparative rapidity of the process, and the ease with which it imitates the manner of painters, have caused it to be now very generally preferred to line engraving by publishers for the transcription of all pictures except those belonging to a severe and classical style of art.

Aquatint may be effectively used in combination with line-etching, and still more harmoniously with soft-ground etching in which the line imitates that of the lead pencil.

Of all kinds of engraving, mezzotint comes nearest to nature, though it is far from being the best as a means of artistic expression. Copper, steel, and zinc are the metals chiefly used in engraving. The use of copper is largely increased of late, as the copper is now coated with steel by electrotype process, which enables it to resist printing almost indefinitely, and the steel can be removed at pleasure. Zinc is similarly coated with copper, and is sometimes used for small editions. [Condensed from *Encyclopædia Britannica*, 9th ed.] See WOOD ENGRAVING.

ENG AND SHANG. . See SIAMESE TWINS, *ante*.

ENLISTMENT (*ante*), in the United States army, is superintended by the bureau of recruiting service, the chief officer of which is stationed in New York. There are quarters or branches in nearly all the large cities of the union, and two depots to which recruits are sent—fort Columbus, New York harbor, and the barracks at Newport, Ky. Men are enlisted for five years, and may be assigned to any branch of the service.

ENLISTMENT DURING THE REBELLION. The following is a list of the various "calls" for troops by the United States government during the war of the rebellion.

Date of Call.	Number of Men.	Term of Service.	Number obtained.
April 15, 1862	75,000	3 months	93,326
May to June 25, 1862	530,000	3 years	714,213
July 2, 1862	300,000	3 years	431,958
Aug. 4, 1862	300,000	9 months	87,000
Oct. 17, 1863	300,000	3 years	374,807
Feb. 1, 1864	200,000	3 years	
Mar. 14, 1864	200,000	3 years	284,021
July 18, 1864	500,000	1-2-3 years	384,882
Dec. 19, 1864	300,000	1-2-3 years	204,568

There were other calls for 30 and 100 days' men. The whole number called for was 2,759,049; total obtained 2,656,553. By act of congress Mar. 3, 1863, called the "conscription act," the president was authorized to draft troops. The act provided for an enrollment, a draft, the reception of substitutes, and arrest of deserters. About 3,000,000 men between the ages of 20 and 45 were enrolled. The calls from Oct. 17, 1863, were orders for drafts. But probably not more than 50,000 drafted men performed personal service. Substitutes were obtained. "The substitute fund" of the government, consisting of money paid in as a release from service, and which was used as a "bounty fund" for volunteers, amounted to \$25,902,029.

ENNEANDRIA, the ninth class of plants in the Linnæan system, so called because the flowers have nine stamens. It is a small class, and the Linnæan classification being now generally superseded, the term is not often used.

ENNS, or ENS, a t. in Austria, on the river Enns, near its junction with the Danube; pop. 769, 3,784. It has iron and steel manufactures. It stands on the site of a Roman station, Lauriacum, where in 304 Galerius inflicted a cruel persecution upon the Christians. The walls of the town were built with the ransom money paid for Richard I. of England.

ÉNOMOTO KAMAJIRO, one of the Japanese young men of promise sent by the tycoon in 1862 to study in Europe. In Holland, E. obtained a solid training in science and naval practice. Returning to Japan in 1867, he was put in command of the *Kaiyo Maru*, a 26-gun vessel of 400-horse power. The revolution breaking out, and the tycoon being overthrown, E. endeavored to obtain from the United States minister, gen. Van Valkenburgh, the possession of the *Stonewall*, formerly a confederate iron-clad ram built in England, captured by the United States forces, and purchased and paid for by the tycoon's government. Being unsuccessful, E. left the anchorage near Yedo, with the seven war vessels under his charge, and sailed to Hakodadi. Being disowned by his former master, E. declared himself and his forces independent, and set up a republic somewhat after the model of the United States, of which he was elected president. This government continued for several months, but by June, 1869, the land and naval forces of the mikado had reached Yezo, and battles rapidly followed each other at Esashi, Matsumae, and Kikonai. Finally, June 4, the final conflict took place at Hakodadi. The three vessels of E. were opposed to the five flying the mikado's flag, one of which was the iron-clad ram *Stonewall*. A terrific naval battle was kept up during several days, while the land forces were engaged almost continually. The "rebel" fleet and forts were utterly destroyed, chiefly by the iron-clad, and on the 26th, E. and the leaders surrendered. He was kept in prison until 1872, when he was pardoned and given a position in the Kai Taku Shi (department of colonization of Yezo). In 1874, he was made vice-admiral in the imperial navy, and sent to Russia as minister plenipotentiary, negotiating the treaty by which Russia gave to Japan the Kurile islands in exchange for the southern half of Saghalien. See KURODA.

ENOS, ROGER, 1736-1808; an officer in Arnold's expedition to Quebec, but sent back with his troops for lack of provisions. He was afterwards an eminent citizen of Vermont.

ENSIGN (*ante*), in the U. S. navy, is the national flag. It is also used in the merchant service to designate the country to which the vessel belongs. There is an officer in the navy called ensign who ranks below master and above midshipman. In the army and the militia an ensign is assigned to each company, his duty being to carry the flag or standard of the company. Sometimes the duty falls to a sergeant.

ENSILAGE, green fodder, preserved for cattle, by a process not unlike that employed in the preparation of sauerkraut. A silo or pit, large or small, is first prepared; usually placed, for convenience of feeding, contiguously to the barn in which cattle are housed. It must be so constructed that the air can be excluded from its contents, and of such form and dimensions as will facilitate their settling into a solid mass, and as, when opened for feeding, will expose to the atmosphere as small a part of the surface as practicable. The construction of a silo 16 to 20 ft. long, 8 ft. wide, and from 15 to 20 ft. deep, is thus described: 12-in. perpendicular walls of hard brick, well laid in cement, with smooth joints. If the ground is sandy or gravelly, the outside of the walls next the earth is covered with a coat of cement, or the walls are filled in behind with clay or clayey earth, to prevent the passage of the air through them. The bottoms are also laid with brick upon the flat in cement. The walls are made so smooth upon their inner sides as to offer no obstacle to the settling and compacting of the food by friction of the sides. The pit may be made either open at the top and covered with a roof, or arched over under ground, with two necks coming up to within one foot of the surface of the ground, through which it is filled. The pit being prepared, the fodder is cut green, when in the best condition, or in bloom, passed immediately through the cutting-machine, to reduce it to uniform short lengths of not more than 1 in., and then deposited and trodden firmly into the pit, sufficient salt being used to render it palatable, but no more. As fermentation—which will commence at once—proceeds, and the mass settles, the cutting and treading in of fresh fodder must be continued from day to day, after an interval of about 36 hours, until the pit is filled and settling has ceased. Then the pit is immediately and thoroughly sealed over the whole top surface of the fodder, by a well-compacted layer of clean fodder, not less than 6 in. thick, excluding the air. Over this layer, some lay planks weighted with heavy stones; others deem this needless. The fodder to be thus treated may be corn, red clover, pearl millet, West India millet, or Guinea corn, green rye, oats, mixed grasses, or any other succulent production of which cattle are fond. Food preserved by this process is greatly relished. It is eaten eagerly and clean, leaf and stalk, without any loss whatever; and stock thus fed exhibit the highest conditions of health and thrift. It is recommended especially for milch cows, as it increases the quantity and improves the quality of milk.

ENSINAL', or EXCINAL, a co. in s.w. Texas, drained by affluents of the river Neuces: 1610 sq.m.; pop. '70, 427. It is a cattle-raising region, and contained, in 1870, 1678 cattle, 5,778 sheep, and produced 9,556 lbs. of wool.

ENTERPRISE, the seat of justice of Volusia co., Fla., on St. John's river and lake Monroe; 205 m. from Jacksonville, at the head of steam-boat navigation. It is a popular winter resort for northern visitors; has sulphur springs, and good hotels.

ENTOMOL'OGY. See INSECTS, *ante*.

ENZIO, or ENTUS, 1225-72; king of Sardinia, a natural son of Frederick II. and the beautiful Bianca Lancia; b. at Palermo. He fought by his father's side against the Lombards at the battle of Cortenuova before he was 13 years of age, and the following year was married to Adelasia, the heiress of Sardinia and Corsica, and given the title of king of Sardinia. In May, 1239, he was declared vicar imperial in northern Italy, and commanded the German and Saracen troops in the imperial army; he entered the March of Ancona, and became so formidable a foe to the papacy, that the distinguished soldier cardinal, John of Colonna, was sent against him. Gregory IX. excommunicated Frederick and his son before the end of the year; and a crusade against them was preached soon afterwards. In 1241, the command of the fleet having been intrusted to Enzo, he gained a splendid victory over the Genoese, sinking three of their vessels and capturing 19. Amongst the captives were three cardinal-legates, and many bishops and archbishops; the booty included the large sums of money which the notorious cardinal Otto had just collected in England. After the death of the pope (August), Enzo was sent with a large army to aid his brother Conrad, king of the Romans, against the invading Tartar hosts; the victory won by the two brothers near the river Delphos finally delivered Europe from the presence of these desolating hordes. Enzo was afterwards sent into Lombardy, which was for several years the scene of his chief exploits. In 1245, he was again excommunicated by pope Innocent IV., and in 1247 he besieged Parma, but was forced to retire. He then besieged Colonna, and in 1249 took the castle of Arola, but, on May 26 of the same year, he was taken prisoner at Fossalta by the troops of Bologna and consigned to perpetual imprisonment. "A captive at the age of 24," says Dean Milman, "this youth, of beauty equal to his bravery—the poet, the musician, as well as the most brilliant soldier and consummate cap-

tain—pined out 23 years of life, if not in a squalid dungeon, in miserable inactivity.” [From *Encyclopædia Britannica*, 9th ed.]

EOON, or EUDO DE STELLA, a religious fanatic of Bretagne in the 12th c., who claimed to be the final judge of mankind. He opposed the hierarchy of the church, and taught that the only true baptism was the baptism of the Holy Ghost given by the laying on of hands. He was believed to have miraculous power, and gained many followers. He was opposed publicly by the cardinal-legate Albericus, and in a book by archbishop Hugo of Rouen. Some of his disciples were burned to death for their heresy. In 1148 he was captured, with some of his leading adherents, and tried before the synod at Rheims, but escaped execution because thought insane. After his death his sect soon died out.

EOS. See AURORA, *ante*.

EOZOIC PERIOD. See ARCHÆAN PERIOD.

EOZO'ON, supposed by some paleontologists to be one of the oldest geological representatives of animal life, and by others held not to be an animal. It was a huge mass of lower organization than the sponges or protozoa, and belonged (if to animals) to the *foraminifera*. It was jelly-like, without definite organs, but probably with power to secrete a calcareous shell. Remains have been found in Canadian rocks, whence the name *Eozoon Canadense*, and in the oldest European rocks.

EPANOMERIA, a t. in Santorini, one of the Grecian islands, built on a steep promontory, so that the houses are ranged in terraces one row above another to the number of 15 or 20. Some are excavations in the rock, and the lowest are 400 ft. above the sea. The place is reached by a winding pathway cut in the face of the cliff, on the summit of which are many windmills.

EP'ARCH, the governor of a province in ancient Greece, or prefect of a region under the rule of Rome. In modern Greece a province of the kingdom is called a nomarchy, and a subdivision of a nomarchy an eparchy. In Russia the term has an ecclesiastical use, denoting the diocese or archdiocese of a bishop or archbishop.

EPHESIANS, EPISTLE TO THE (see *ante*), is universally admitted to have been written by the apostle Paul. It is expressly ascribed to him by Ignatius (if indeed any writings attributed to him are genuine), who was contemporary with Paul; is alluded to by Polycarp, a friend of the apostle John, and cited by Irenæus, Clement of Alexandria, Tertullian, Origen, and many subsequent writers. Some critics have maintained that it was not addressed to the Ephesians, but either to the Laodiceans or to several churches in common, of which Ephesus may have been one. The reasons which they assign for this opinion are: 1. That Marcion, a heretical writer of the 2d c., asserts that in his copy of the epistle the reading was “in Laodicea,” and not “in Ephesus.” The answer to this is that as Marcion is known to have altered the text in other instances to suit his own views, he is not to be trusted, especially when all known ancient manuscripts and all ancient versions read “in Ephesus.” 2. That as Paul directed the Colossians to read the epistle *from* Laodicea, he must have written an epistle *to* Laodicea, which is either this so called epistle to Ephesus or else has been lost. To this the answers are: (1) If he did write to Laodicea, it may have been a letter designed for local and temporary use only. As Christ said and did many things which he did not design to have recorded in the small book of the New Testament, why may not an apostle have written some things which were not to have a place there? (2) Paul charged the Colossians to let the epistle which he sent them be read by the Laodiceans; but why would he have wished this so earnestly if at the same time he had written to Laodicea this “epistle to the Ephesians” (which so greatly resembles that to the Colossians), and had intrusted both to the same messenger to be delivered at about the same time? (3.) It is said that if the epistle had been written to the Ephesians, among whom Paul had spent three years of most loving and successful ministry, it could not have been so general in its style, and would have contained personal salutations at the close. To this the answers are: (1) This epistle and that to the Colossians, written at the same time, both show that Paul's thoughts were intent on Colosse, Laodicea, Hierapolis, those whom he had never seen, the Gentiles at large, and God's eternal purpose with reference to them all. In all that he then wrote, therefore, themes of general and permanent interest might naturally prevail to the exclusion of personal and transient things. (2) At the close of the epistle he expressly says that he has committed all matters of a personal nature between himself and his readers to the beloved and faithful brother who was the bearer of the epistle, and whom he sent to them for the very purpose of making them acquainted with his condition and of comforting their hearts. Such provision having been made for loving salutations and all other particulars which his former relations to the Ephesians would prompt, the entire absence of them from the epistle itself is explained.

The doctrinal part of the epistle contains thanksgiving to God for the revelation of his eternal purpose of grace to men; prayer that Christians may receive the full measure of the blessings provided for them; the native character of mankind as dead in

sins; regeneration by the grace of God, and the benefits, present and future, resulting from it; salvation by divine grace and not by human works; good works the fruit of regeneration; privileges resulting from the reception of salvation by grace; statement of God's purpose to receive the Gentiles among his people; repeated prayer that Christians may receive the fullness of the blessings provided for them; renewed ascriptions of perpetual glory to God in the salvation of men. The practical part consists of exhortations to Christian unity, progress in the new life, general holiness of conduct and heart, the particular virtues of truthfulness, self-control, honesty, purity in words and deeds, sobriety, cheerfulness, fidelity in the relations of wives and husbands, children and parents, servants and masters, and strenuous maintenance of the spiritual warfare, by strength to be obtained from God and under the protection of the armor which he provides.

EPIDENDRUM, a genus of epiphytic orchids, of which there are two examples in the United States, one growing upon magnolia trees. The blossoms are greenish-purple, growing in large clusters. Some of the many species in the tropics are very showy, and some have cathartic qualities.

EPIGÆA REPENS. See **ARBUTUS**.

EPIGONI, in general, sons of descendants, applied more particularly to certain mythical chiefs who fought against Thebes. After the catastrophe which brought about the death of Jocasta and the blinding of *Edipus*, *Eteocles*, and *Polynices*, the sons of *Edipus* and *Jocasta* incurred the wrath of their father, whom they sent forth alone and blind to fight with poverty. The father's curse rested on them, and resulted in the famous "war of the seven against Thebes." All the chiefs who led the war were slain except *Adrastus*. A second war was undertaken by the children of the fallen chiefs, and this is known as the "war of the Epigoni." The Epigoni were victorious, and Thebes was taken, *Thersandrus*, the son of *Polynices*, being seated on the throne of *Cadmus*. In literary history, the term *E.* is sometimes applied to a scholar who limits himself to unfolding the ideas of the great masters of a previous age.

EPIMACHUS, a genus of birds of Australia and Papua, not unlike the bird of paradise; in color, violet black or black brown, with a collar of feathers margined with green at the base of the neck. The tail feathers consist of about 12 long plumes ending in thread-like points. The head and breast are brilliant blue.

EPIPHEGUS, a parasitic herb growing from the roots of the beech tree, and seeming to grow from the ground independently. It is 6 to 12 in. high, purple or yellow-brown, slender, with scales instead of leaves. In Virginia it is called "cancer-root," and has the reputation of being a specific for that disease.

EPISCOPACY. 1. After much discussion, standard writers on both sides of the question now admit that the term "episcopos," when it appears as a term of office in the New Testament, is synonymous with "presbyter," the same officers of the church being called by both names—the one with reference to their duties, and the other to their age. The "presbyters" or elders of the Ephesian church were called by Paul "bishops" or overseers of the flock. In the pastoral epistles, both words are used interchangeably. Peter, exhorting the "presbyters" as their brother "presbyter," speaks of their office as that of an overseer or "bishop." 2. In each church of the new testament there seems to have been, at first, a plurality of presbyters or bishops. In the church of Ephesus (as has just been said), there were presbyters who were bishops. In the church at Philippi, there were bishops as well as deacons. Paul and Barnabas, in their journey, ordained presbyters in every church. 3. In each church, it may be taken for granted that some one of the officers was chosen to preside. This choice, the advocates of prelacy affirm, was made at first by apostolic authority or in imitation of apostolic example. Presbyterian and Congregational writers, on the other hand, regard it as only a wise human arrangement similar to that which convenience and order suggest in all associations of men. 4. Gradually the two synonymous names of office were divided; "bishop" being restricted to the president, and "presbyters" continued to the rest. This division, the prelatical theory of church government asserts, was made by apostolic agency in the accomplishment of a divine intention that the bishop, as a successor of the apostles, should be vested with authority over the presbyters and the church. The non-prelatical theory, on the contrary, affirming that the apostles, as such, had no successors, maintains that the division of title and of function was made without apostolic agency and contrary to the spirit of the Savior's command; that it was a result of the innate tendency in human nature to exercise and to yield authority, greatly stimulated and aided by imitation of the absolute control exercised by the civil government. 5. Even after this change had taken place, the episcopal office was regarded, theoretically, as possessing equal authority and honor. But gradations of rank began at once, practically, to arise similar to the gradations in civil government throughout the Roman empire. Bishops in the country and in the smaller towns or villages became subordinate to the bishop of the adjacent city. 6. As the chief city of each district had the civil rank of a "metropolis" or mother city, so the bishop of that city, styled metropolitan from his position, took the lead in the deliberations of the

local synod as "*primus inter pares*," and acted as the representative of his brother bishops in their intercourse with other churches. Thus, though all bishops were nominally equal, a superior dignity and authority came by general consent to be vested in the metropolitans. 7. A still higher dignity was assigned to the bishops of the chief seats of government—Rome, Alexandria, and Antioch; and among these the bishop of Rome, the capital of the empire, had precedence. 8. Convenience dictated that the ecclesiastical divisions should follow the civil divisions of the empire. Roman emperors saw with amazement Christianity copying their jurisdiction in every part of the land. As the struggle deepened, the Christian bishop and the Roman governor became two rival authorities, the representatives of warring kingdoms within the same domain. When Christianity, instead of being destroyed, became the established religion, and the two administrations were made one, the resemblance between them was perfected, and the gradations of ecclesiastical rank which had grown up by custom were ordained by law. The empire was divided, as to its secular government, into four prefectures; these were subdivided into dioceses, and the dioceses into provinces. The rulers of cities and districts were subject to the governor of their province; the governors of provinces to the governor of their diocese; the governors of dioceses to their prefect; and the prefects to the emperor. In like manner, the bishops of cities and districts were subjected to the metropolitan of their province; the metropolitans of the provinces to the metropolitan of their diocese; the metropolitans of the dioceses to the patriarch of one of the chief cities (of which there were now four), Rome, Constantinople, Alexandria, and Antioch; and the patriarchs of these cities, like the prefects, had, at first, no superior except the emperor. 9. Theoretically, all these primatial sees were co-ordinate in authority and mutually independent. But by degrees the bishops of the more important cities overshadowed their brethren, and exercised a supremacy which, though due rather to custom than to recognized claims, was increasingly acquiesced in from the manifest advantage of having a strong central power which could interfere in theological controversies or ecclesiastical disputes with an authority to which all would bow. 10. As the cities, Rome and Constantinople were both capitals of the empire, so their bishops were exalted above all others. And as these two cities became rivals for the supreme place, so the two bishops contended with each other for the first place as universal bishop. 11. At length the western and eastern churches were torn asunder. With the decline of the empire, the grandeur of the eastern church was obscured, until both empire and church were overwhelmed by the Ottoman power and the Mohammedan faith. With the rise of new kingdoms and the conversion of new nations in the west, the bishop of Rome was lifted up as "the head of the universal church."

EPISCOPAL CHURCH, PROTESTANT, is the title of that portion of the Christian church in the United States which, before the revolution, was a part of the church of England. Its history is naturally divided into two periods. I. *During colonial times.* The settlement of Jamestown was commenced in 1607. Its charter required that the true word and service of God should be preached, planted, and used according to the rules and doctrine of the church of England, not only in the colonies, but also, as far as possible, among the savages around them. Rev. R. Hunt labored in his vocation with piety and zeal to the end of his life. After him, Rev. A. Whittaker acquired, by his devoted exertions, the title, "Apostle of Virginia." Under his instrumentality Pocahontas was converted and baptized. As the first colonists in Virginia were all members of the church of England, provision was made for ministerial support by allowing 1500 lbs. of tobacco and 16 barrels of flour, per annum, to each minister, and by setting apart in each new borough a portion of land for a glebe. Tithes were subsequently introduced. None but ministers who had received episcopal ordination could legally officiate in the colony. The officers and agents of the company, in their efforts to promote morality and religion, were exhorted "to employ their utmost care to advance all things appertaining to the order and administration of divine service according to the form and discipline of the church of England, carefully avoiding all factious and needless novelties, which only tend to the disturbance of peace and unity." As an endowment for a college, 10,000 acres of land were given and a large amount of money was collected. Great zeal in behalf of the conversion and education of the Indians was felt, and a strong hope was cherished that the contemplated institution would be very useful to them. But, in 1622, they conspired against the English and murdered many of them. This embittered the minds of the survivors, and arrested all plans for their advancement in education and religion. During the next half century, owing to political disturbances and other causes, religion greatly declined throughout the colony, so that in 50 parishes nearly all were destitute of glebe, parsonage, church, and minister. In 1685, Rev. James Blair came as missionary to Virginia, and having been appointed commissary to the bishop of London, exerted, during an administration of more than 50 years, a very great influence in restoring and enlarging the work of the Episcopal church. By his efforts the college of William and Mary was founded in 1693. The colony of Maryland, founded in 1633 by lord Baltimore, a Roman Catholic, with 200 families and several priests, offered free admission "to every person professing to believe in Jesus Christ." At lord Baltimore's death, in 1676, there were 10 counties and 16,000 inhabitants, the majority of whom were Protestants. On the accession of

William of Orange, "a Protestant revolution" took place, and a royal governor was sent into the colony. In 1692, the church of England was established by law, the province was divided into 30 parishes, and tithes for the support of the Episcopal ministers were imposed on every inhabitant, no matter what were his religious preferences and creed. Dr. Thomas Bray was appointed commissary of the bishop of London for the province of Maryland. By his efforts before leaving England, the societies "for promoting Christian knowledge," and "for the propagation of the gospel in foreign parts," were established. After his arrival in Maryland he entered with zeal into his work, and was active in having a bill passed, in which it was provided, "that the Book of Common Prayer and administration of the sacraments, with the rites and ceremonies of the church according to the use of the church of England, the psalter, and psalms of David, therein contained, be solemnly read by all and every minister or reader in every church, or other place of public worship, within this province." Dr. Bray's actual residence in Maryland was soon interrupted, but his zeal in behalf of the church of England, as established therein, continued to the close of his life. At this date a majority of the inhabitants are reported as in communion with that branch of the church.—In the colonies of Carolina and Georgia Episcopal churches were planted and continued to flourish. New York was first colonized by the Dutch in 1615, and, in its religious opinions and forms, was Presbyterian. In 1664, it was seized by the English. After this, precedence was given to the church of England, and a tax levied for its maintenance. Trinity church, New York city, was founded in 1696; its first rector, Rev. W. Vesey, was also for half a century commissary of the bishop of London. This corporation is now celebrated for its great wealth. In New Jersey the early settlers were principally Quakers, Presbyterians, and Congregationalists; but all other Christians enjoyed entire religious liberty. Missionaries of the society for propagating the gospel worked earnestly and with good effect in the establishment of Episcopal churches. In Pennsylvania the first church of this order was Christ's church, Philadelphia, founded in 1695; and at various other points missionaries of the English society engaged in successful work. The first colonies of New England, composed chiefly of English Puritans and Separatists, who came to America mainly to escape the restrictions and oppressions to which they had been subjected by church laws at home, sought to exclude episcopacy. Because of the severe measures adopted for this purpose, and from other causes, for 60 years after the landing of the pilgrims there were no Episcopal churches in New England. In 1679, Charles II., on the earnest representation of some of the inhabitants, had one built in Boston. From that time, through the efforts of the English missionary society, some progress was made. Missionaries were sent to various points, who were honest, faithful, and laborious in traveling and preaching the gospel. If the church of England had appointed bishops for the colonies, the growth of the denomination therein would doubtless have been greater and more rapid.

II. *After the attainment of national independence.* At the beginning of the revolution there were in the middle and eastern states about 80 Episcopal ministers, many of whom had received a large part of their support from the English society. After the war, aid from that source was, of course, withdrawn. Many of the ministers and people had adhered to the crown during the struggle, and at its close left the country. Soon after, the landed endowments of the church of England in Virginia were lost, and Episcopalians were thrown on their own resources. They were poor, and their prospects were not bright. Two things were necessary—to secure union among the churches of the several states, and to obtain bishops. The first was accomplished by the formation of the general convention, which has ever since been accepted as the governing body of the Episcopal church in the United States. The first American consecrated to the episcopal office was bishop Seabury, who, about 1785, obtained consecration from Scottish bishops. In 1789, William White and Samuel Provoost were consecrated, by the archbishop of Canterbury and other English bishops, as bishops of Pennsylvania and New York; and, in 1790, James Madison was consecrated, also by English bishops, as bishop of Virginia. In arranging the order of common prayer the English prayer-book was retained, with such alterations as the political changes had made necessary, and with some other modifications. It came into immediate use, and has since been maintained without material alteration. The Episcopal church having thus early organized itself in accordance with the new life of the country, soon began to increase. It is now strong in large cities and flourishing towns; has many adherents among persons of wealth and culture; and, aided by its complete and zealous organization of the church as a missionary society, not only continues to increase in the older states, but also extends its churches and dioceses over all parts of the land. It is steadily subdividing its dioceses, and is considering the expediency of arranging them all, according to geographical position, into four provinces, to be united under a council that shall meet once in a fixed term of years. The doctrine of the American Episcopal church is that of the church of England, "which while it receives the Holy Scriptures as the ultimate rule of faith, does not throw them open to the varying interpretations of every man's private judgment, but explains them by the creeds, by definitions of Christian doctrine made by the general councils, and by the aid of traditions which it believes to have come down through an unbroken line of teachers from the apostles themselves." The growth of this church during the present century is shown in the following table:

Years.	Number of Dioceses.	Bishops.	Presbyters and Deacons.	Total.
1820.....	15	9	301	310
1830.....	20	11	514	525
1840.....	27	19	1,040	1,059
1850.....	29	32	1,557	1,589
1860.....	33	43	2,113	2,156
1870.....	39	52	2,786	2,838
1879.....	48	61	3,314	3,375

The following statistical summary, taken from the *Church Almanac* for 1890, gives the figures for 1879 so far as reported:

Dioceses.....	48
Missionary districts (including Africa, China, and Japan).....	13
Bishops.....	61
Priests and deacons.....	3,314
Whole number of clergy.....	3,375
Parishes, about.....	2,900
Ordinations (in 32 dioceses and 2 miss. districts).....	180
Candidates for deacon's orders (in 34 dioceses and 4 miss. districts)	303
Baptisms (" 42 " " 8 " ")	40,296
Confirmations (" 43 " " 8 " ")	24,652
Communicants (" 48 " " 10 " ")	322,713
Sunday-school teachers (" 41 " " 5 " ")	27,547
Sunday-school scholars (" 42 " " 8 " ")	253,137
Contributions (" 40 " " 8 " ")	\$6,068,272

EPISCOPAL SYSTEM, in the Roman Catholic church, is the name given to the theory which vests the supreme ecclesiastical power in the whole body of bishops. It was urged most powerfully in the conflicting papal elections which occurred during the 14th century. All who adopted it declared that the general councils of the church were above the pope. Among this class the university of Paris and the Gallican church were conspicuous. The theory continued to spread, also, in Germany, where Nikolaus von Hontheim, co-adjutant bishop of Treves, was one of its chief supporters, and, in 1763, wrote his celebrated book concerning it. In 1785, the archbishops of Treves, Mayence, Cologne, and Salzburg, agreed in demanding from the pope the restoration of the episcopal privileges which had formerly been vested in the German archbishops. But the declaration of the infallibility of the pope by the Vatican council has put an end to all debate on the subject, and, for the present at least, made the episcopal system impossible in the Latin church.

EPISTATES, the title of the presiding officers of the great councils of the Athenians, the Ecclesia and the council of Five Hundred. The E. held office for only one day at a time.

EPISTLES, SPURIOUS, have been forged by various unknown authors, and for a variety of purposes. Many of them are lost, but a considerable number are extant, among which are the following: 1. *The Epistle of Paul to the Laodiceans*.—In the early part of the 2d c. there was a Greek epistle with this title. It was received by the heretic Marcion, but is generally believed to have been a forgery founded on Paul's direction to the Colossians to read the epistle from Laodicea. "Some," said Theodoret in the 5th c., "imagine Paul to have written to the Laodiceans, and accordingly produce a certain forged epistle; but the apostle does not say *to*, but *from*, the Laodiceans." There is also an epistle with this title now extant in Latin, which, however, cannot be proved to be a translation of the former, but has, probably, a comparatively modern origin. It was first published in 1517, but existed in manuscript, at an earlier date, in the library of the Sorbonne. 2. *The Third Epistle of Paul to the Corinthians*.—Many persons have inferred from several passages in the two genuine epistles that Paul wrote a third which is not in the canon. There is still extant in the Armenian language an epistle professedly from the Corinthians to the apostle, with his reply. It was quoted in the 3d c. by Gregory, the illuminator, first bishop of Armenia, but has not been noticed by any ancient Greek or Latin writer. 3. *The Epistle of Peter to James* was forged in very early times, and is supposed to have been used as an introduction to the *Preaching of Peter*, which was held in great esteem by some early Christian writers, and was considered a genuine work by Clement of Alexandria (about the end of the 2d c.), Theodotus of Byzantium, and others. It was used by the heretic Heracleon in the 2d century. Origen (first half of 3d c.) did not receive it as the work either of Peter or of any other inspired person. Its author, perhaps, was one of the Ebionites at the opening of the 2d century. 4. *The Epistles of Paul and Seneca* comprise eight long letters in Latin from the philosopher Seneca to the apostle Paul, and six from Paul to Seneca in reply. They are certainly ancient. Jerome (about the end of the 4th c.), supposing them genuine, valued them highly, and was led by them to place Seneca in his catalogue of saints. At that

time they were read by many. Augustine (about the same time) also speaks of them as genuine. Some learned men of more modern times accept them, but by far the greater number pronounce them spurious. 5. *The Epistle of Publius Lentulus*, written from Jerusalem to the Roman senate. It contains (but with many variations of the text) the following oft-quoted description of the personal appearance of Christ: "A man of tall stature, good appearance, and a venerable countenance, such as to inspire beholders with both love and awe. His hair, worn in a circular form and curled, rather dark and shining, flowing over the shoulders, and parted in the middle of the head, after the style of the Nazarenes. His forehead smooth and perfectly serene, with a face free from wrinkle or spot, and beautified with a moderate ruddiness, and a faultless nose and mouth. His beard full, of an auburn color, like his hair, not long but parted. His eyes quick and clear. His aspect terrible in rebuke, placid and amiable in admonition, cheerful, without losing its gravity: a person never seen to laugh, but often to weep." Dr. Edward Robinson, after a careful examination of the whole subject, comes to the following judgment: "*In favor* of the authenticity of the letter we have only the purport of the inscription. There is no external evidence whatever. *Against* its authenticity we have the great discrepancies and contradictions of the inscription; the fact that no such official person as Lentulus existed at the time specified, nor for many years before and after; the utter silence of history in respect to the existence of such a letter; the foreign and later idioms of its style; the contradiction in which the contents of the epistle stand with established historical facts; and the probability of its having been produced at some time not earlier than the 11th century." 6. *An Epistle of the Virgin Mary*, said to have been written in Hebrew, but extant in Latin, addressed to the Christians of Messina, and giving name to the metropolitan church of "Our Lady of the Letter." 7. *An Epistle of the Virgin* to the Florentines. 8. *From the same* to Ignatius, with his reply. Numerous other spurious epistles need not be noticed here.

EPITHELIO'MA, a variety of cancer, attacking surfaces covered with epithellum or epithermis. See CANCER.

EQUATION, PERSONAL, a correction important chiefly in astronomical observations. Two observers, each of admitted skill, often differ in their record of the same event—as the passage of a star before the wires of a transit instrument—by a quantity nearly the same for all observations by those persons. This quantity is their relative personal equation. Each observer habitually notes the time earlier or later than the fact, by a minute and nearly uniform portion of a second. This quantity is his absolute personal equation. The correction is of no value when comparison is made between the records of the same observer, since each is in error in the same way, but it becomes important when the work of different observers is combined. The value and sign of the personal equation is found for each observer by the discussion of a large series of observations. It is a reliable correction for the work of only trained observers, who have, by long practice, acquired a habitual method of work which is uniform, even their errors conforming to a system.

EQUIPMENT AND RECRUITING, BUREAU OF, a department in the U. S. navy having charge of supplying vessels with rigging, sail, anchors, and all stock necessary for a voyage; also, the managing of the enlistment of seamen and boys, and of the recruiting service generally.

EQUITES. See EQUESTRIAN ORDER, *ante*.

ÉRARD, SÉBASTIEN, 1752-1831; b. Strasburg; distinguished for improvements upon the piano and the harp. He went to Paris, where the duchess of Villeroi became his patron, and in her house he made his first piano, which was one of the earliest manufactured in France. He became suddenly famous, and established a large manufactory in Paris, and during the revolution in London. Thenceforward devoting his life to the development and improvement of his favorite instrument, he brought it to a perfection before unknown.

ÉRATHI, a co. in central Texas, drained by Bosque river; 900 sq. m.; pop. 70, 1801-89 colored. The surface is rolling and tolerably fertile, but best adapted to pasturage. Co. seat, Stephenville.

ÉRATO, one of the nine muses, daughters of Jupiter and Mnemosyne. She presided over amatory and nuptial poetry.

ERDMANN, JOHANN EDUARD, a German philosopher; b. 1805; studied theology at Dorpat, attended the lectures of Schleiermacher and Hegel, and became a pastor. In 1836, he was appointed professor of philosophy at Halle. He has published a number of works, the most important of which is an attempt to give a learned explanation of the *New Philosophy*.

ERDMANN, OTTO LINNE, 1804-69; a German chemist, educated at Dresden and the university of Leipsic; professor of chemistry at Leipsic, where he established a model laboratory. He made important discoveries in the qualities of nickel, and of indigo and other dye-stuffs. He founded a journal devoted to chemical science, and published a number of works on the subject.

EREBUS, MOUNT, and MOUNT TERROR, volcanoes discovered in 1841 in South Victoria land, in the Antarctic ocean, lat. $77\frac{1}{2}^{\circ}$ s. The first is 12,400 ft. high; the other about 11,000 ft. When discovered, Mt. Erebus was in active eruption.

EREGLI, or EREKLI (anc. *Heraclea*), a t. and port in Asia Minor, on the Black sea, 128 m. e.n.e. of Constantinople; pop. 5,000. There is a good harbor, some ship-building, and export trade in timber, coal, silk, linen, wax, etc. The coal mines are extensive, and yield much of the supply of Constantinople. E. is the place where the 10,000 Greeks under Xenophon embarked on their return.—Another town of the same name, 55 m. n.w. of Constantinople, has a harbor on the sea of Marmora.

ERETRIA, a city in the island of Eubœa, founded before the war of Troy, and anciently the rival of Chalcis in commerce. It was destroyed 490 B.C., by the Persians, but was soon rebuilt, and was active in the Peloponnesian war. It was the seat of the school of philosophy established by Menedemus, a disciple of Plato. The ruins of the city are still visible.

ERIC THE RED, a native of Norway, b. about 950 A.D. He fled from Norway to escape punishment for homicide, and settled on the w. coast of Iceland. Another homicide compelled his flight from that country, and in 984 he went to Greenland, which had been discovered by Gunnbjörn 100 years before, but not settled. He gave the strange land its incongruous name to attract settlers, and became the leading man in the colony, calling the chief town Gardar. The settlements flourished for about four centuries, when they suddenly disappeared from history, and were remembered only as "the lost colonies of Greenland." It is supposed that the entire people were carried off by the plague known as the "black death," in the latter part of the 14th century. Eric is erroneously set down in some books as the discoverer of the American continent. It was his son Leif Ericsson who first landed on the continent somewhere in New England in the year 1000, and he had been preceded by Bjørne Hierulfsen, who sailed along Labrador and Newfoundland in the year 986, but did not land.

ERICSSON, JOHN (*ante*), 1803; b. in Sweden, where he became a distinguished engineer. He came to New York in 1839, and two years afterwards was employed on the war-steamer *Princeton* (the first war-steamer having its propelling machinery below the water-line), his own invention of the screw-propeller being used. E. soon became known for the great number and novelty of his inventions, some of which were a steam-boiler with artificial draught, which did away with smoke-stacks and effected an important saving in fuel (this invention was at once applied to railway locomotives); a steam fire-engine; the caloric engine; the screw propeller for steam navigation; a sliding telescopic chimney; machinery to check the recoil of heavy guns; an instrument for measuring distances at sea; the hydrostatic gauge for measuring the volume of fluids under pressure; a meter to measure the amount of water passing through pipes; an alarm barometer; a pyrometer to measure temperature from the freezing of water to the melting of iron; a lead to take soundings without rounding the vessel to the wind; and various modifications of his caloric engine. In the war of the rebellion he was engaged in building "monitors" (so called from the name of the first one), iron ships with revolving iron turrets for the guns. The first one was built in a little more than three months, and, Mar. 9, 1862, defeated and destroyed the confederate iron-clad *Merrimac*. Of late years he has been trying to perfect the solar engine, for which heat is obtained from the rays of the sun collected by a huge funnel lined with reflecting surface.

ERIE, a co. in w. New York on lake Erie and Niagara river, intersected by the Erie, the New York Central, the Lake Shore, the Buffalo and Jamestown, and the Buffalo, Corry, and Pittsburg railroads, and the Erie canal; 1071 sq.m.; pop. '75, 190,570. The surface is undulating and the soil fertile, producing wheat, corn, oats, and abundant pasturage. There are beds of hydraulic cement, and good limestone. Co. seat, Buffalo.

ERIE, a co. in n. Ohio, on lake Erie, drained by Vermillion and Huron rivers, and crossed by the Lake Shore, the Cincinnati, Sandusky, and Cleveland, and the Sandusky, Mansfield, and Newark railroads; 260 sq.m.; pop. '70, 28,188. It is mostly level, producing wheat, corn, barley, butter, wool, wine, etc. Co. seat, Sandusky.

ERIE, a co. in n.w. Pennsylvania, on lake Erie between New York and Ohio; traversed by the Lake Shore, the Philadelphia and Erie, and the Erie and Pittsburg railroads; 740 sq.m.; pop. '70, 65,973. With the exception of a ridge running parallel with the lake the surface is generally level. The productions are corn, wheat, oats, butter, lumber, etc. Co. seat, Erie.

ERIE (*ante*), a city in Pennsylvania, on lake Erie, nearly midway between Buffalo and Cleveland. The town was laid out in 1795, was incorporated as a borough in 1805, and in 1851 chartered as a city. It is the seat of justice for Erie county. It has had a rapid increase of population—from 3,412 in 1840 to 19,646 in 1870. It stands upon an elevated bluff overlooking the lake; the streets are broad, intersecting each other at right angles; there are several parks, and the harbor is one of the best on the lake. Erie is connected by railroad with Buffalo on the e., Philadelphia on the s., and Cleveland, Detroit, etc., on the west. The manufactures of the place include steam-engines, stoves, machinery, car-wheels, bricks, leather, petroleum-refining, organs, pumps, furniture, brass-works, and brewing. The extensive coastwise trade is carried on partly by

steamers and partly by sailing vessels. The harbor, protected by the island of Presque Isle and by a breakwater, has a depth of from 9 to 25 ft.; and the docks are provided with every facility for the transfer of merchandise to and from the railroads. The principal articles of shipment are lumber, coal, iron ore, and petroleum. There are several national banks, with an aggregate capital of nearly \$1,000,000. The Union railway depot is a fine building, 400 ft. in length by 88 ft. in width. The schools are well organized, and there are 30 churches of different denominations. The fleet with which Perry defeated the British in the naval battle in Put-in bay, in the war of 1812-15, was built and equipped here.

ERIE, BATTLE OF LAKE, a naval engagement in the war of 1812 between Great Britain and the United States, fought in Put-in bay, near the western end of lake Erie, Sept. 10, 1813. The American fleet, which had been built at Erie, ran the British blockade on the 12th of August, and sailed west. It consisted of 9 vessels, with 54 guns and 490 officers and men. The British had 6 vessels, mounting in all 63 guns, with 502 officers and men. Only 2 vessels of the American squadron were in the proper sense vessels of war, the others having been built for trade. The American guns, though of heavier caliber, were of shorter range than those of the British; but the American fleet had an advantage in the better quality of its seamen. The American commandant was lieut. Oliver Hazard Perry. At the opening of the battle Perry's flag-ship *Lawrence* was disabled, but he left her in command of lieut. Yarnall and shifted his flag to the *Niagara* under a heavy fire. The remainder of the fleet now joined in the attack upon the enemy, compelling the almost immediate surrender of the British flag-ship *Detroit* and three other vessels. The remaining two attempted to escape, but were overtaken and captured. Perry at once sent a dispatch to gen. Harrison, saying, "We have met the enemy, and they are ours—two ships, two brigs, one schooner, and one sloop." The battle lasted 3 hours, and about 13 men were killed and wounded on each side. The American supremacy on the lakes being established, Detroit was evacuated by the British, and peace established in Michigan. Gold medals were conferred by congress upon Perry and Elliott, the leaders in the battle, and minor rewards upon the other officers and men. In 1858, on the anniversary of the battle, the remains of the officers killed were buried on Put-in bay island, where a monument has been erected to their memory.

ERIE CANAL, connecting the Hudson river at Albany and Troy with lake Erie at Buffalo, is 363 m. in length. It was begun in 1817, and completed in 1825, at a cost of \$7,602,000. Its construction is due chiefly to the foresight and energy of De Witt Clinton, and while it was in progress it was often ridiculed by self-complacent skeptics as "Clinton's big ditch." The enterprise was undertaken and carried through by the state of New York, Clinton being governor during nearly all the period of its progress. As its route lay chiefly through an uninhabited wilderness, it opened for settlement an immense territory. It was subsequently enlarged, and is now 70 ft. broad at the surface, and 56 ft. at the bottom, with a depth of 7 feet. The locks, 72 in number, 57 of which are double, and 15 single, are 110 ft. long and 18 ft. wide. It is carried by great stone aqueducts across several large streams, and in some places it is cut through solid rock. It is supplied with water from lake Erie, 142 m. from Buffalo to Seneca river. Most of the flow of water is from the w. towards the e., the only exception being between Lodi and the Seneca river, where there is a fall westward through 5 locks. At Rome, a little w. of Utica, a supply of water is received from the Black river canal. Between Rome and Syracuse water is drawn from Cazenovia lake and other reservoirs, while at Syracuse it supplies water to the Oswego canal. Buffalo is 568 ft. above the level of the Hudson at Albany, the difference being overcome by locks at various points. The canal has been immensely successful, contributing largely to the growth of New York, Buffalo, and intermediate places. The railroads, though affording means of more rapid communication, and having the advantage of being open at times when the canal is frozen, have by no means superseded the latter.

ERIES, an Indian tribe of the same family as the Hurons and the Iroquois, or Six Nations, once dwelling in the neighborhood of Niagara falls, but forced inland by hostile tribes. About 1653, they were attacked by the Iroquois, and in 1656, nearly exterminated. Those who remained of the tribe became incorporated with the Senecas.

ERIE SHALE, a name given to the extension w. of the Upper Portage and Chemung rocks of New York. It overlies the Huron shale, the latter being the storehouse of petroleum.

ERIN'YES. See *EUMENIDES*, *ante*.

ERIS, in Greek mythology, sister of Mars, daughter of Nyx (night), and sister of Nemesis. Eris, or "strife," is represented at first as insignificant, but growing until her head touches the heavens. It was Eris who at the marriage festival of Peleus and Thetis flung on the table the golden apple inscribed to the fairest of the fair, for which Juno, Venus, and Minerva contended. Virgil gives Eris the name of Discordia.

ERIVAN', or **IRWAN**, a government of Russia on the borders of Persia, Georgia, and Armenia; 10,670 sq. m.; pop. 452,001. The largest river is the Aras, or Araxes, and Ararat is the principal mountain. There are valuable mines of gold and other minerals, and salt is produced in large quantities. Chief town, Erivan.

ERMAN, GEORG ADOLPH, son of Paul; b. Germany, 1806. In 1828-30, he traveled around the world chiefly to make observations in magnetism, and published an account of his journey, from which the portion describing Siberia was translated into English. He has published other works on plants and animals, and since 1841 has been principal editor of a scientific publication chiefly concerning Russia. He has been for a number of years professor of physical science in the university of Berlin.

ERMAN, PAUL, 1764-1851; b. Berlin. At first intending to study for ordination in the church, he turned to pursue physical sciences and became a teacher in the French gymnasium in Berlin, and later in the military academy. When the university of Berlin was founded he was chosen professor of physics, and held the office until his death. He made important discoveries in electricity, magnetism, optics, and physiology, and wrote valuable works on these subjects.

ERMELAND, an old division of Poland, now in the province of Königsberg, Prussia; 1600 sq. m.; pop. about 200,000. It is a Roman Catholic diocese, with a see at Frauenburg.

ERNEST AUGUSTUS, 1771-1851; fifth son of George III. of England. As duke of Cumberland he was for a long time a member of the house of lords, where he was an extreme tory. When his brother William IV. died, 1837, he became king of Hanover, where he became notorious for tyranny and licentiousness. His blind son George was his successor, reigning until Hanover was annexed to Prussia.

EROSTRATUS. See HEROSTRATUS.

ERSKINE, HENRY, 1746-1817; a Scotch lawyer, brother of Thomas, lord Erskine. He was lord advocate of Scotland in 1782 and 1806. In politics he was a whig; but his fame rests chiefly on his wit and tact as an advocate.

ERSKINE, THOMAS, of Linlathen, 1788-1879; a Scotch writer on theology and religion. He was a descendant of the earl of Mar, regent of Scotland under James VI. He studied law at Edinburgh university, and, 1810, became a member of the faculty of advocates. He retired from the bar in 1816, on succeeding to the family estate after the death of his brother. Erskine's principal works are: *Remarks on the Internal Evidence of the Truth of Revealed Religion*; *Essay on Faith*; *Unconditional Freeness of the Gospel*; *The Brazen Serpent*; *Doctrine of Election*; and *Spiritual Order and Other Papers*.

ERYTHRÆAN SEA, in ancient geography, a name applied to an indefinite expanse of the Indian ocean, but including the Persian and Arabian gulfs. Later geographers restricted the name Erythræan to the Arabian gulf.

ERYX, an ancient city and mountain in the w. part of Sicily, near the sea-shore. There was once a temple to Venus on the mountain. Eryx was taken and retaken in the Carthaginian wars, and was partially destroyed by Hannibal. The site of the old city is now occupied by a convent, and the mountain by a Moorish castle, used as a prison, around which is the modern town of San Giuliano.

ERZERUM, or ERZROUM, a province embracing a large portion of Turkish Armenia, bordering on Russia and Persia, between 39° and 41° n. and 39° and 44° e.; pop. about 500,000. It is mainly a high table-land, and is traversed by several mountain ranges, between which are fertile valleys. The climate is subjected to extremes of cold and heat. The chief rivers are the Aras, or Araxes, the Euphrates, and the Kur. Chief town, Erzerum.

ESARHAD'DON was the son of Sennacherib, king of Assyria. Nothing is known, positively, concerning him until his accession to the throne after the murder of his father by two other sons. The length of his reign cannot be determined, but the number of his military expeditions and the extent of his architectural works show that it must have continued many years. The order in which its principal events occurred is not known. He reigned personally at Babylon as well as Nineveh, having palaces at both cities and residing alternately in each. This fact explains and justifies the Scripture statement that Manasseh, king of Judah, when taken captive, was brought before the king of Assyria at Babylon. The monuments indicate that E. was one of the mightiest of the Assyrian kings. He conquered all Asia between the Persian gulf, the Armenian mountains, and the Mediterranean sea. On the w., his influence extended over Cilicia and Cyprus; on the e., he made war against tribes which his fathers had not known; and on the s., asserted authority over Egypt and Ethiopia. He built numerous temples that shone with silver and gold, and palaces that surpassed in magnificence those of his predecessors. The s.w. palace at Nimrud, built by him, was of extraordinary size, its great hall being 220 ft. by 100, and its porch 160 ft. by 60. It was adorned with the usual array of winged bulls, colossal sphinxes, and sculptured slabs of alabaster. When first uncovered it was apparently in a good state of preservation, but it was soon evident that fire had raged through it, splitting and calcining the alabaster slabs, which consequently crumbled to dust when exposed to the air. In his unfinished palace at Calah the slabs around the rooms were smoothed in readiness for the inscription, but when they were turned, in order to be carried away, their backs were found to be sculptured, showing

that they had been taken from an older building, and that E., having consigned to oblivion the records of a former reign, was preparing to celebrate his own exploits on the reversed sides of the slabs.

ESCAMBIA, a co. in s. Alabama on the Florida border, intersected by Escambia and Conecuh rivers, and the Mobile and Montgomery railroad; 1000 sq. m.; pop. '70, 4,041—951 colored. The soil is level and sandy, and not very productive. Co. seat, Pollard.

ESCAMBIA, a co. on the extreme w. of Florida, on the gulf of Mexico between the Escambia and Perdido rivers, intersected by the Pensacola and Mobile railroad; 860 sq. m.; pop. '70, 7,817—2,880 colored. It has a level sandy soil, not very productive, and to a large extent covered with pine forests. Co. seat, Pensacola.

ESCHATOL'OGY, the doctrine concerning the last things, in the Christian system, treats of the millennium, the future coming of Christ, the state of man after death, the resurrection, last judgment, and final condition of mankind.

I. *The Millennium and the Future Coming of Christ.*—The xxth chapter of Revelation speaks of a period of a thousand years during which Satan shall be bound in the bottomless pit, and the souls of them who had been beheaded for the witness of Jesus and for the word of God, and who had not worshiped the beast or his image, and had not received his mark upon them, shall live and reign with Christ. This is called the first resurrection. Many persons, uniting this passage with others and professing to interpret them literally, teach that the millennium will be preceded by the second coming of Christ in visible glory, and by the resurrection of the glorified saints to reign with him on earth. Their opinion on this important point naturally colors their interpretation of a large portion of Scripture and of their practical duties as Christians. Many of them are very earnest and confident in the maintenance of their views. In opposition to them the usual faith of Christians has been that the millennium will precede the visible coming of Christ, and will be accomplished through the divine blessing, given in copious measures, on the diligent use of such means of grace as the church has always employed. They who adopt this view regard the passage in the Revelation concerning the first resurrection as figurative (as the rest of the book manifestly is), and the coming of Christ, promised in the New Testament, as: 1. An exhibition of his providential government over the history of the world and of the church. In this sense the destruction of Jerusalem by the Romans, followed by the dispersion of the Jews, Matt. xxiv. 4-28, and the establishment of the kingdom of Christ, with the gathering of his elect, 29-44, were foretold by him as a coming of the Son of Man. 2. His spiritual presence with his people during their lives and work on the earth, and at the time of their death, Matt. xviii. 20; John xiv. 23, 3. 3. His glorious appearing to judge the world, Matt. xxv. 31; 1. Thes. iv. 16.

II. *The State of Man after Death.*—1. Materialists, who assert that the soul is only a function of the body say, consistently enough, that at death both perish together. 2. Pantheists, who maintain that man is a transient form of God's existence, teach that the soul has no consciousness after death. The race is immortal, but the individual man is not. Flowers bloom from generation to generation, but each flower blooms but once, and after that exists no more. 3. Some, who are neither materialists nor pantheists, suppose that the soul cannot act or manifest itself without a bodily organism, material or other, and that consequently at death it must either cease its activity, or be furnished at once with a new body. The latter part of the alternative many of the class referred to do not hesitate to accept. "Do the dead cease to exist?" they ask, and quickly reply, "No: for there is the spiritual body as well as a natural body; at death the latter is dissolved, but the former is not affected; therefore the life of the soul, still clothed upon, remains unharmed." Those who reject this theory deny that the soul is dependent on matter for the exercise of its faculties, or for its personality, or its susceptibility. Certainly God, who is purely a spirit, is not thus dependent: and as men have a spiritual nature like that of God, the theory cannot be true concerning them. To this it is rejoined that the theory of a "spiritual body" does not require that it be any form of matter. 4. Many who reject or disregard the Bible, while they do not deny that the soul continues to exist after death, say they have no proof that it does. Some of this class when dying have declared that they were taking a leap in the dark. 5. The Scriptures teach the continued existence of the soul after death. The Pentateuch teaches it when it calls God the God of Abraham, Isaac, and Jacob after their death, thus implying that they still lived. The Psalms teach it when they speak of the soul as redeemed from the power of the grave, and as being satisfied when it awakes in God's likeness. The prophets teach it when they declare that the dead shall live, that they shall awake and shine as the stars forever and ever. The New Testament teaches it by the promises of Christ, "I give unto them eternal life and they shall never perish;" and by the affirmation of the apostles that Christ hath abolished death and brought life and immortality to light. 6. All who believe in a future resurrection and final judgment necessarily believe in an intermediate state of the soul after death, in some respects different both from its former condition in this life and from its final condition in the life to come. The question is, What is the nature of this intermediate state? (1) Some suppose that between death and the resurrection the soul continues in an unconscious state. Since the Bible speaks of death as a sleep, and since a dead body is

as incapable of sleep as a stone, it must be (they think) the soul that sleeps. To this a sufficient answer is that in death the outward appearance of the body is exceedingly like sleep, and that it is for this reason death is compared to it; just as, on the other hand, the actual sleep of a living person has been called the "counterfeit of death." (2) The Roman Catholic church teaches that all who, dying in the peace of the church, are not perfect, pass into purgatory, concerning which they say that it is a state of suffering designed for both expiation and purification; that the duration and severity of the suffering are proportioned to the sinfulness of the sufferers; that the duration may be shortened and the severity alleviated by the prayers of the saints and the sacrifice of the mass; and that it is the prerogative of the church to remit, entirely or in part, the penalty of sins under which the soul suffers. This doctrine was not held, in its completeness, even by Roman Catholics until a comparatively late period. "Purgatory as a burning away of sins," said Dollinger at the Bonn conference of Old Catholics in 1875, "was an idea unknown, in the east as well as the west, until Gregory the great introduced it. What was thought was that after death those who were not ready for heaven were kept for some time in a state of preparation, and that the prayers of the living were an advantage to them. Gregory the great added the idea of a tormenting fire. This the schoolmen gradually converted into doctrine which they associated with papal indulgence, till it came to apply to the dead generally, which of course made all seek for indulgence. It went on to have degrees (some could receive indulgence for a few of their sins, others for all), so that eventually the pope, having already the keeping of heaven and the dominion on earth, obtained also sovereignty under the earth." (3) The general faith of Protestants is not uniform on this point; probably the prevalent view is "that the souls of believers are at their death made perfect in holiness, and do immediately pass into glory." According to this view the intermediate state of believers is one of perfect freedom from sin and suffering, and of great exaltation and blessedness. This is not inconsistent with believing that after the second coming of Christ and the resurrection the soul will be still more exalted and blessed. And with it may be mentioned, as not altogether contrary to it, the opinion of many, in both ancient and modern times, that "sheol" and "hades" are general terms for the intermediate dwelling-places of the dead, one division of which is "paradise," the happy abode of the saved; and the other "gehenna," the wretched abode of the lost.

III. *The Resurrection.*—Faith in the resurrection of the body, as additional to the future life of the spirit, rests on revelation. Swedenborgians (and some others in part agree with them) hold that man in this life has two bodies, one external and material, which dies and is buried, never to rise again; the other internal and psychical, which, incapable of death, passes in union with the soul into the invisible world as its spiritual body: the resurrection, therefore, in their view occurs at the moment of death. The Scriptures, in their obvious sense, plainly teach an actual resurrection of the dead. "All that are in the graves shall come forth." "That which is sown a natural body shall be raised a spiritual body." "The corruptible must put on incorruption, and the mortal immortality." In some true and noble sense, the body raised will be personally representative of that deposited in the grave; for St. Paul, denying the identity of the two—"thou sowest not the body that shall be," and declaring the divine mystery—"God giveth to the seed a body as it hath pleased him," asserts the reciprocal pertinence of the two, each to each—"and to every seed his own body." Zoologists teach that with every living germ there is an immaterial principle by which one species is distinguished from another. In like manner, some suppose that as the soul is created to be incarnate, it is endowed with forces to that end; that, besides its rational, voluntary, and moral faculties, it has what may be called a vital force, which secures the formation of a body suited to its necessities and sphere. Concerning the nature of the spiritual body, nothing can now be known except what Scripture has revealed. From this source we learn that it will be an organism not of flesh and blood, but specially suited to the new state of being in which man is to live and act. Yet it is probable that it will be the glorified likeness of the human form as it existed in this life—the ideal human organism actualized.

IV. *The Final Judgment.*—The consciences of men affirm that God as the judge of all the earth must do right, and also that his moral government, as administered in this present world, does not fully render unto all according to their character and desert: "There are just men unto whom it happeneth according to the work of the wicked; and there are wicked men unto whom it happeneth according to the work of the righteous." Consequently, reason, even among the heathen, calls for a settlement of the destinies of men, so that the justice of God may be vindicated. The Scriptures declare that a final settlement will be made: "God shall bring every work into judgment, with every secret thing, whether it be good or whether it be evil." This judgment is represented as a definite future event, in which the destiny of men and of angels will be determined and manifested: "God hath appointed a day in which he will judge the world in righteousness." The word "day," while not to be taken literally, implies, it is claimed, a definite and limited period. Christ, as God manifest in human personality, and as having made atonement for the sins of mankind, will be the judge: "The Father hath given him authority to execute judgment also because he is the Son of

Man." The ground of judgment will be the deeds done in the body; and the character and life of each man will be judged according to the light that he had, and (if he knew the gospel) according to the relation (determined by his own choice) which he sustains to Christ: "He that heareth my word and believeth on him that sent me hath everlasting life, and shall not come into condemnation; but is passed from death unto life."

V. *The End of the World.*—The Scriptures teach that the existing heaven and earth are to be replaced by a new creation: "They shall wax old as a garment, and be changed." "The heavens shall pass away with a great noise, and the elements shall melt with fervent heat; the earth also and the works that are therein shall be burned up. Nevertheless, we, according to his promise, look for a new heavens and a new earth wherein dwelleth righteousness." "I saw a new heaven and a new earth; for the first heaven and the first earth were passed away, and there was no more sea." 2. In the Scriptures, the abode of the saved is sometimes called the better country, even the heavenly; sometimes "the city which hath the foundations;" and sometimes a "house not made with hands," as when the Savior said, "In my Father's house are many mansions, I go to prepare a place for you." 3. The blessedness of the heavenly state may be conceived of as arising, in part, from the vision of God in his glory as seen in the Lord Jesus, from the experience of his love, from the enlargement and glorification of the mental faculties, from the absence of sin and sorrow, from intercourse and fellowship with the holy and happy society of heaven, and from the possession of all good! 4. The wretchedness of the lost—of which, as to its nature or modes, little appears in the Bible, while its certainty and reality are abundantly declared—is conceived of as consisting, partly, in eternal separation from the society and influence of the good, and from fellowship with God's glory, blessedness, and love; in the presence and influence of ungodly and wicked beings; in remorse of conscience and in the power of sin in the soul. Some claim scriptural authority for conceiving of it as consisting in the ultimate and utter extinction of the personal being, sinking under sin. 5. The blessedness of the saved and the wretchedness of the lost appear in the Scriptures as without end. After much debate as to exegesis of the texts involved, the drift of the most recent critical scholarship may be said to be unmistakably towards this decision—that while the Greek language did not possess, as the Greek thought did not require, terms which necessarily carried the meaning of absolute eternity, as we now employ that word (e.g., in reference to the being of God), Christ and his apostles used, in reference to future reward and retribution, such words expressive of unlimited duration as were furnished by the language of their time; and that the whole manner and bearing of their speech on this point seems to intend an avoidance of any suggestion of an end. Especially in regard to retribution, the fact is recognized that the most decisive utterances concerning it are not from the apostles, but from Christ himself, who as the "light of the world," and the professed Savior of men, would have been quick to supply the hope of limited duration, had any such hope been within his thought. There is, however, to be noted a tendency towards statements on this point far less sweeping and dogmatic than were formerly advanced, and a distinct enlargement of the bounds of admitted variations of belief concerning it among the denominations called evangelical.

ESCH'ENMAYER, KARL ADOLF AUGUST VON, 1770–1852; b. Würtemberg; teacher of practical philosophy at the university in Tübingen, 1818–36; author of many works on philosophy, some of which were directed against the theories of Hegel and against the *Life of Jesus*, by Strauss. He carried a strong tendency to mysticism into his physical researches, and took a deep interest in the phenomena of animal magnetism, becoming at last a devout believer in demoniacal and spiritual possession.

ESCOBAR Y MENDOZA, ANTONIO, 1589–1669; a Spanish casuist descended from the illustrious house of Mendoza; educated by the Jesuits and a member of the order. He was a preacher for 50 years, delivering sometimes two sermons in a day. His principal works were on casuistry and on Scriptural commentary. His casuistry was severely criticised in the *Provincial Letters* of Pascal, and ridiculed by Boileau, Molière, and La Fontaine, and the name Escobar became a synonym in France for extreme laxity in moral principle.

ESDRAË'LOU, a great plain in Palestine, separating the mountain ranges of Galilee from those of Samaria. It forms a triangle between Nazareth in the n., a pass opening toward Akka in the w., and Jenin, the ancient Egunium, in the south. The watershed extending from Nazareth to Jenin, about 15 m., may be considered the base of the triangle, and divides the lands drained by the Jordan from those watered by the Kishon. The Galilean hills, forming the n. boundary of the plain, extend from Nazareth w. 12 m., and there draw near the Carmel range, forming a narrow pass by which the Kishon finds egress toward the sea. The Carmel, or Samaria, range extends from this pass s.e. 18 m. to Jenin. The e. boundary rises at times into high hills, the most important of which is Mt. Gilboa. The plain is sometimes called the valley of Jezreel. This plain of E. has in all history been a battle-field. It was the scene of important battles between the Israelites and their enemies, among them the triumph of Barak and the defeat of Saul and Josiah. Here the Egyptians and the Assyrian hosts met in repeated struggles, and in later times it appears in the wars of Napoleon. In the sublime imagery of the

book of the Revelation, this plain appears as the scene of the last great struggle between the powers of good and evil.

ESMERALDA, a co. in s.w. Nevada, on the California border, intersected by Walker river, and containing Walker lake, a large body of water having no known outlet; 7,850 sq.m.; pop. '75, 1288. There are gold and silver mines, but little agriculture, the land, where not mountainous, being arid plains. Co. seat, Aurora. The great salt basin, in this county, is covered with pure salt, and is 16 m. long and 3 m. wide.

ESOP. See *Æsor*, *ante*.

ESPOUSAL. 1. Among the Jews, the ceremony of betrothal or of engagement to be married. It was entered into a year or more before marriage, and consisted in giving and receiving before witnesses, either a piece of silver as a pledge, or a written contract wherein the bridegroom bound himself to give a certain sum as a portion to the bride. From the time of espousal the woman was considered as the lawful wife of the man to whom she was betrothed. 2. In the early Christian church also, a ceremony of espousals preceded marriage. The preliminaries consisted in a mutual agreement between the parties that the marriage should take place within a limited time, confirmed by certain donations as the earnest of marriage, and attested by a sufficient number of witnesses. The free consent of parties contracting marriage was required by the old Roman law and by the code of Justinian. The gifts bestowed were publicly recorded. The dowry settled on the bride was stipulated in public instruments under hand and seal. The ring was given at the betrothal rather than at the actual marriage. The use of the marriage ring has been traced to the 10th c., its recognized place being then as now on the woman's fourth finger. The witnesses present, friends of both parties, were usually ten in number. The espousal, as incorporated with the wedding-rite, is plainly traceable in the usages of the Roman, Anglican, and other churches at the present day.

ESS, **HEINRICH LEANDER VAN**, or **JOHANN HEINRICH**, 1772-1847; b. Westphalia; educated in the Dominican gymnasium of Warburg; a Roman Catholic priest from 1799 to 1812; and then professor of theology in the Marburg seminary. In 1807, he published the New Testament in German, but its circulation was forbidden by the pope. The next year he published a defense of his views, advocating the reading of the Bible by the people. In 1816, he published *What was the Bible of the first Christians?* and in 1818, *The Bible not a Book for Priests*. In 1840, he completed a German translation of the entire Bible. His library of 20,000 volumes, unusually rich in early editions of the controversial works of the period of the reformation, was purchased after his death, and given to the Union theological seminary in New York.

ESSAYS AND REVIEWS, by six clergymen and one layman of the church of England (the Rev. Drs. Frederick Temple and Rowland Williams, prof. Baden Powell, H. B. Wilson, Mark Pattison, prof. B. Jowett, and Mr. C. W. Goodwin), were published in an 8vo. vol. in Mar., 1860. The book did not excite much attention at first, but having been severely censured for heterodox views by nearly all the bishops and many of the clergy, it created much excitement in 1861, and was condemned by convocation June 24, 1864. The ecclesiastical courts sentenced the Revs. R. Williams and H. B. Wilson to suspension for one year, and costs, Dec. 15, 1862; but on appeal the sentence was reversed by the judicial committee of the privy council, Feb. 8, 1864. The most remarkable among the works put forth in opposition (in 1862) are the *Aids to Faith*, edited by the bishop of Gloucester (W. Thomson, now archbishop of York), and *Replies to Essays and Reviews*, edited by the bishop of Oxford (Samuel Wilberforce). The appointment of Dr. Temple to the see of Exeter was much opposed on account of his essay in this collection.

ESSEG. See *ESZEK* (*ante*).

ESSEN, **HANS HENRIK**, Count, 1755-1824; b. Sweden; educated in the state university; accompanied Gustavus III. in his travel abroad. He attended the king at the masked ball where the latter was assassinated by Ankarstroem, Essen having warned Gustavus of a probable attempt on his life. In later years, Essen was governor of Stockholm, governor-general of Swedish Pomerania and Rügen, and in 1807, commander of the Pomeranian army, distinguishing himself by the defense of Stralsund. Still later he was a member of the council, and ambassador in Paris. After the union of Sweden and Norway he was appointed governor of the latter country, and in 1817, governor-general of Scania.

ESSENCE, in philosophy (from *esse*, to be), is that which constitutes the particular nature of a being or substance, or of a genus, and which distinguishes it from all others. Locke's statement, that E. may be taken for the very being of a thing, whereby it is what it is, agrees with this definition. He makes, also, a distinction between nominal and real E., saying, for example, that the nominal E. of gold is the complex idea expressed by the word; and that its real E. is the constitution of its insensible parts on which its properties depend and which is unknown to us. In theology, Athanasius and other Greek writers distinguish *ουσία* (essence or substance), denoting what is common to the Father, Son, and Holy Spirit, from *ὑπόστασις*, denoting what is individual, distinctive, and peculiar. In modern writers, essence and substance are generally used

as virtually synonymous, and representing, in any object, all that the human mind cannot know, while all that can be actually known is called quality or accident. As both terms are often vaguely employed, it is necessary, wherever they occur, first of all to ascertain the sense in which the writer intends them to be understood.

ESSES, COLLAR OF, a chain-like collar, composed of links in the shape of the letter S; found in various old insignia of England. It is said to have been worn by esquires especially. Some claim the SS to be the symbol of Saint Simplicius.

ESSEX, a co. in n.e. Massachusetts on the New Hampshire border and the ocean, traversed by the Merrimack and Ipswich rivers, and the Boston and Maine, the Eastern, the Salem and Lowell, the Danvers and Newburyport, and some other railroads; 520 sq.m.; pop. '80, 244,640. It has a rugged and uneven surface, and its business is mainly in manufactures of cotton, wool, leather, etc. There are quarries of granite and syenite. There are six cities or large towns in the co., and it has three co. seats. Salem, Newburyport, and Lawrence.

ESSEX, a co. in n.e. New Jersey, almost encircled by the Passaic river, and bordering on Newark bay; intersected by the New Jersey, the Morris and Essex, and the Paterson and Newark railroads; 150 sq.m.; pop. '80, 189,819. The soil is fertile; but besides market gardening there is little of agriculture, the people being mostly engaged in manufactures. Co. seat, Newark.

ESSEX, a co. in n.e. New York, w. of lake Champlain, on the head waters of the Hudson, and intersected by Au Sable river, and the Champlain division of the Delaware and Hudson canal company's railroad; 1926 sq.m.; pop. '80, 34,515. In the w. part of this co. are the highest peaks of the Adirondacks, covering a large region entirely unsettled. The soil is fertile. There are beds of magnetic iron ore, and a number of extensive iron works. There are nearly 100 lakes, large and small, in the county. Co. seat, Elizabethtown.

ESSEX, the n.e. co. of Vermont, between the Connecticut and Passumpsic rivers, crossed by the Grand Trunk railway; 790 sq.m.; pop. '80, 7,961. It is a rough and cold region, not favorable to the growth of cereals. There are very large forests of sugar maple. Co. seat, Guildhall.

ESSEX, a co. in e. Virginia, bounded by the Rappahannock, which is navigable; 270 sq.m.; pop. '70, 9,927—6,650 colored. The surface is uneven, and the soil for the most part sandy. Co. seat, Tappahannock.

ESSEX, a co. in the province of Ontario, Canada, between lakes Erie and St. Clair; traversed by the Great Western and the Canada Southern railroads; 235 sq.m.; pop. '71, 32,697. Co. seat, Sandwich.

ESSEX, ROBERT DEVEREUX, Earl of, 1591-1646. He was a companion of the prince of Wales. At the age of 15 he was married to Frances Howard, daughter of the earl of Suffolk, but nine years afterwards the marriage was annulled on account of the wife's intimacy with Rochester, earl of Somerset. A second marriage also ended unhappily. In 1620-23, he served in the wars of the palatinate, and in 1625 was vice-admiral of a fleet which made an unsuccessful effort to capture Cadiz. In 1629, he was lieutenant of the army sent against the Scotch covenanters; but no fighting was done. His summary dismissal made him an enemy of the king (Charles I.), and in 1642, he was commander of the parliamentary army. He won the battle of Edgehill, captured Reading, and relieved Gloucester; but in 1644, because of his unwillingness to fight the king in person, he lost nearly the whole of his army. In 1645, he resigned his commission, but was granted an annuity of £10,000 for his past services.

ESSEX, THOMAS CROMWELL, Earl of. See **CROMWELL, THOMAS**, *ante*.

ESTAFETTE, in Europe, an express for the conveyance of letters and small packages. The articles are consigned to the care of the postilions on duty along the route.

ESTAING, CHARLES HECTOR, Comte d', 1729-94; a French admiral, b. Auvergne. He first entered the army, and in 1757, as brig.gen., accompanied count de Lally to the East Indies. At the siege of Madras, 1759, he was made prisoner, but was released on parole. He at once resumed service in command of two ships of war, and being again taken captive in 1760, he was thrown into prison at Portsmouth for breaking his parole. He was soon released, and was appointed lieutenant in the navy in 1763, and in 1777 vice-admiral; and in 1778, commanded the fleet sent to aid the United States against Great Britain, bringing with him Gérard, the first French ambassador to the United States. He planned, with the American generals, a combined land and naval attack on Newport; and his demonstrations forced the British to burn or sink six frigates lying in the harbor; but Lord Howe came, with an English fleet, to relieve Newport, and d'Estaing put to sea to engage him. A sudden storm separated the fleets, and d'Estaing put into Boston to repair his shattered ships. In Nov. he sailed to the West Indies, where he captured St. Vincent and Grenada, compelling the fleet which had come to relieve Grenada to retire to the harbor of St. Christopher. With 22 ships he co-operated, Oct. 9, 1779, in the unsuccessful attack on Savannah, and was himself wounded. The following year he returned to France. He commanded the combined fleet before Cadiz, when the treaty of peace was signed in 1783. Entering into French politics, he was

elected to the assembly of notables in 1787, in 1789 he commanded the national guard, and in 1792 the national assembly chose him admiral. In 1793, he bore testimony in favor of Marie Antoinette. The following year he was himself brought to trial, condemned, and executed.

ESTATE (*ante*), in law a term signifying in its broadest sense an interest in any kind of property, but more especially in lands. By the common law there are two general divisions of estates in lands, according to the amount of interest in the same in different cases. There are, first, freehold estates; secondly, estates less than freehold. A freehold estate is for life or longer. An E., the possession of which is limited to a certain number of years, or circumscribed by other conditions, is less than a freehold, ranking as personal property. Freehold estates are estates of inheritance, or estates not of inheritance, the latter being for life only. A freehold E. may be held either in fee simple or in fee tail, the first expressing the highest interest which a man can have in land, the latter implying limitations of some sort. Estates less than freehold are either held for a time specified at will, or by sufferance. An E. at will is terminated by either party by such notice as has been mutually agreed upon. An E. is held by sufferance when the occupant holds over after expiration of time. Estates are divided again into legal and equitable; again into estates in possession and estates in expectancy; and still again into estates in severalty, in joint tenancy, in common, and in coparcenary. An E. in severalty is one which has but a single owner; an E. in joint tenancy is one owned jointly by two or more individuals; an E. in common is one where separate but individual interests are held by different persons; an E. in coparcenary is one held by females in the land of an intestate ancestor.

ESTHER, **BOOK OF**, records events in Jewish history belonging to the interval of nearly 60 years that elapsed between the sixth and seventh chapters of Ezra. It has always been accepted by the Jews as canonical, and by many of them is esteemed worthy to be classed with the Pentateuch itself. Among Christians some have questioned its canonical authority, because it does not mention even the name of God, and because, as they say, it breathes a spirit of national pride and of revenge. To these objections it has been replied that, although the name of God does not appear, his providence is, in fact, exhibited, and the advantage of prayer and faith is shown; and that the traits of character ascribed to both Persians and Jews of that day are in strict accordance with history. While the book may be reasonably defended on these grounds, the defense appears much more triumphant on the hypothesis, which many advance, that the whole narrative is a transcript from the records of the Persian court which Esther or Mordecai obtained from the king. When it is read with this idea in mind, new light is poured on it. Everything in it is seen to be stated according to the Persian view, and the book bears the same relation to the Bible as the decrees of Nebuchadnezzar, Cyrus, and Darius recorded in the books of Daniel and Ezra. According to this view the book itself is not to be regarded as inspired, and no part of it need be defended as if it were. It exhibits Persian luxury, despotism, and caprice, as well as traits of Jewish character that are not to be praised. If any ask, "What, then, is inspired about the book?" the answer is that the direction to place it in the canon of Scripture was inspired; just as the direction to record Satan's words to Eve and to Christ was inspired, although the words themselves were blasphemous and false. That this historical narrative should have a place in Scripture was important on many accounts, one of which alone (capable of being rightly estimated only by the Divine mind) was sufficient to require it, viz., that the interposition of God's providence to save the Jews when they were in imminent peril of being exterminated might be shown to the world. That, without this interposition, the line of human descent from which the Messiah was to spring would, in all probability, have been cut off, *links the book of Esther into the unity of the Scriptures by which they all refer to Christ*. And as the Passover, observed by the Jews throughout their generations, is the memorial of their exodus from Egypt, so the feast of Purim, likewise observed by them to this day, commemorates their deliverance through Esther the queen.

Apocryphal Additions to the Book.—In the Septuagint version of E. there are six important passages, having no Hebrew original, inserted at different points of the narrative, and forming with the rest a well digested whole. They were probably designed to meet the objection that the book did not contain the name of God, and to make his agency in the deliverance of his people more prominent and clear. In the 4th c. after Christ, when Jerome translated the book into Latin, he gave first the parts contained in the Hebrew, and placed the six others by themselves, adding marks and explanations by which their design and connection might be known. But in subsequent editions of the Vulgate these explanations were removed and the additions printed as supplemental chapters of the original book. This plan, which greatly impairs their significance and force, has been followed in the English version of the apocryphal parts, where they are called "*The rest of the chapters of the book of Hester which are found neither in the Hebrew nor in the Chaldee.*"

ESTIENNE, or **ETIENNE**. See **STEPHENS**.

ESTILL, a co. in central Kentucky divided into nearly equal parts by Kentucky river; 320 sq. m.; pop. '70, 9,198—599 colored. It has abundant water-power, and mines of iron and coal, with hilly but fertile soil. Co. seat, Irvine.

ESTRAYS', or **STRAYS**, domestic animals found wandering about without apparent home or known owners. In England the owner has a year and a day in which to claim such cattle, and the proprietor of the inclosure where they are found must make proclamation in a church and in market-towns. When these conditions are fulfilled they belong to the proprietor of the inclosure. The law of estrays varies in the different states of the American union. In some, after an estray has been advertised and kept for a certain time it is sold to pay the charges of advertising and keeping, any balance going to the town treasury. Cattle at large contrary to regulations, or breaking into growing crops and doing damage, can in most states be sent to a pound, and after a short time sold to pay damages and expenses.

ESTREES, GABRIELLE D', 1571-99; a beautiful French girl who, at the age of 16, became a favorite of Henry III. and about the same time of cardinal De Guise and the dukes of Bellegarde and Longueville. In 1590 she met Henry IV. soon after his great victory at Ivry. He became desperately enamored, but she did not immediately discard her old lover, the duke of Bellegarde. Henry gave her a husband in one M. de Liancourt, but soon afterwards divorced them and raised her to the rank of marchioness, and in 1595 to duchess of Beaufort. Henry lavished riches upon her, and when she died she was the owner of a dozen estates near Paris. The king desired to divorce his lawful wife and marry her, but Sully had sufficient influence to delay the matter until the death of Gabrielle. This event happened suddenly, and not a few persons suspected foul play. She had borne the king three children.

ESZTERHÁZY. See **ESTERHÁZY, ante.**

ESZTERHÁZY, NICHOLAS IV., Prince **ESZTERHÁZY DE GALANTA**, 1765-1833; b. Hungary; a traveler, and a liberal patron of the arts and sciences, the founder of a valuable picture-gallery in his castle in Vienna. His country seat he transformed into a temple of music, and erected there a mausoleum to Haydn. It is said that Napoleon, with a view of weakening Austria, offered the crown of Hungary to Eszterhazy, who firmly refused it.

ESZTERHÁZY, NICHOLAS JOSEPH, Prince **ESZTERHÁZY DE GALANTA**, count of Forchtenstein, 1714-90; grandson of Paul IV., the head of the third branch of the house. He was distinguished as a soldier in Silesia, but is better known as a patron of art. He served as ambassador at several European courts.

ESZTERHÁZY, PAUL IV., Prince **ESZTERHÁZY DE GALANTA**, head of the third branch of the house of Eszterhazy, 1635-1713; was an Austrian field-marshal, and distinguished in the wars with the Turks. In 1687, he was made a prince of the Holy Roman empire, in reward for his great services in defending Vienna and Ofen from the Turks.

ESZTERHÁZY, PAUL ANTHONY, Prince **ESZTERHÁZY DE GALANTA**, 1786-1866; son of Nicholas IV.; for the greater part of his life a diplomatist. He was ambassador of Austria at Rome twice, once at Dresden, and once at London. In the Hungarian uprising of 1848, he was minister of foreign affairs. After the suppression of the revolution he retired from public life.

ETAH, a district in British India, included in the division of Agra, s. of the Ganges; between 27° 20' and 28° n., and 78° 30' and 79° 20' e.; 1512 sq.m.; pop. '72, 703,527, about seven eighths Hindus. It is chiefly an elevated alluvial plain, with some fertile land. The productions are wheat, barley, cotton, sugar-cane, opium, indigo, etc. There are two harvests in the year. The manufacture of indigo is a leading industry. This region was the seat of a primitive Aryan civilization.

ÉTAMPES, ANNE DE PISSELEU, Duchesse d', 1508-76; mistress of Francis I. of France, over whom she had very great influence. But she was exceedingly jealous of Diana of Poitiers, the mistress of the dauphin (afterwards Henry II.), and under this passion betrayed state and army secrets to Charles V. After the death of Francis she was banished from court.

ETCHEMINS, formerly an Indian tribe in Maine, now represented by the Penobscots and the Passamaquoddies. They dwelt between the Micmacs and the Abenakis tribes. There are about 1000 still left. Nearly all are Roman Catholics.

ETCHMIADZIN', **EDCHMIADZIN**, or **ITSMIADZIN**, a t. and monastery in the Russian government of Erivan, famous as the seat of the catholicus, or primate of the Armenian church. It is situated in the plain of the Aras or Araxes, about 2,985 ft. above the sea, 12 m. w. of Erivan, and 30 m. n. of Mt. Ararat. The monastery comprises an extensive complex of buildings, and is surrounded by brick walls 30 ft. high, which, with their loopholes and towers, present the appearance of a fortress. Its architectural character has been considerably impaired by additions and alterations in the modern Russian style. On the w. side of the quadrangle is the residence of the primate; on the s. the refectory, built by the catholicus Abraham, 1730-35; on the e. the lodgings for the monks; and on the n. the cells. The cathedral is a small but fine cruciform building, with a Byzantine cupola at the intersection, a large tower at the western end, and a smaller tower above each wing of the transepts. Of special interest is the porch,

built of red porphyry, and profusely adorned with sculptured designs somewhat similar to those of Gothic architecture. The interior of the church is decorated with Persian frescos of flowers, birds, and scroll-work. It is here that the catholicus confers episcopal consecrations by the sacred hand of St. Gregory; and here every seven years he prepares with great solemnity the holy oil which is to be used throughout the churches of the Armenian communion. Of the numerous relics, the chief are the head of the spear which pierced the Savior's side; a piece of Noah's ark, presented by an angel to St. James of Nisibis; and a piece of the true cross. Outside of the main entrance are the alabaster tombs of the primates Alexander I. (1714), Alexander II. (1755), Daniel (1806), and Narses (1857); and in hospitable contiguity a white marble monument erected by the East India company to mark the resting-place of sir John Macdonald, who died at Tabriz in 1830, while on an embassy to the Persian court. The library of the monastery is said at one time to have contained 15,000 volumes, and in spite of depredation and neglect, it still remains a rich storehouse of Armenian literature. Among the more remarkable manuscripts are a copy of the Gospels in a massive binding of carved ivory, dating from the 10th or 11th c., and three Bibles of the 13th c., one of which had belonged to Aytoun II., king of Armenia. A type-foundry, a printing-press, and a bookbinding establishment are maintained by the monks, who publish a weekly Armenian newspaper called *The Ararat*, and supply religious and educational works for their co-religionists. The number of inmates in the monastery varies considerably. In 1844, there were 50 monks and 13 bishops and archbishops; and in 1872, there were 5 bishops and archbishops, 20 monks, and 25 novices. The revenue, estimated at \$50,000, is derived from the conventual domains, which, though much less extensive than formerly, still comprise not only a number of estates, but five villages, presented or rather restored by the Russian emperor. The catholicus has an annual income of \$7,500. To the e. of the monastery is a college and seminary of modern erection. At the distance of about half a mile stand the churches of St. Rhipsime and St. Guiana, two of the early martyrs of Armenian Christianity; the latter is of special interest as the burial-place of all those primates who are not deemed by the synod worthy of interment beside the cathedral. From a distance the three churches form a striking group, and accordingly the Turkish name for Etchmiadzin is simply "Utch-Kihssi," or the "Three Churches;" a fourth of less importance is ignored. The town of Etchmiadzin, or as it should be called Vagharshapat, contains about 8,000 inhabitants, but has long ceased to be of any individual importance. According to Armenian historians, it dates from the 6th c. B. C., and takes its name from king Vagarsh, who, in the 2d c. A. D., chose it as his residence and surrounded it with walls. According to the legend, the great apostle of Armenia, St. Gregory the illuminator, having seen the Savior descend in a flood of light in the neighborhood of the palace, was ordered by an angel to erect a church on the spot. He observed the divine command in 309, and gave the building the commemorative name of "Edch-Miadzin," or "Descended the Only Begotten." In 344, Vagharshapat ceased to be the Armenian capital, and in the 5th c. the patriarchal seat was removed to Tovin. The monastery was founded by Narses II., who ruled 524-33; and a restoration was effected by Gomidas in 618. At length, in 1441, the primate George or Kevork brought back the see to the original site, and from that day to the present time Etchmiadzin has been the center of the Armenian church. In the Russo-Persian war of 1827, though the monastery was declared neutral territory by both belligerents, it was occupied by Russian troops. (*Encyclopædia Britannica*, 9th ed.)

ETE'OCLES and **POLYNICES**, sons of Œdipus and Jocasta, cursed by their father for shutting him up in prison. In order to prevent the fulfillment of his prediction that they would engage in fratricidal strife for the throne, they agreed to reign on alternate years. Eteocles, the elder, began, but when his year was up he refused to vacate. Then Polynices, who had married a daughter of Adrastus, king of Argos, headed the famous expedition of the seven against Thebes. The brothers met in single combat and both were slain.

ETESIAN WINDS, a name given by the Greeks to the winds that prevailed for six weeks in summer over the countries near the Mediterranean. They started from the desert regions of torrid Africa, and were hot and dry, but in crossing the Mediterranean they became charged with moisture, and on reaching the n. and e. shores precipitated much-needed rain.

ÉTEN, ANTOINE, b. Paris, 1806; a sculptor, pupil of Dupaty, Pradier, and Ingres. He has traveled in Italy, Algiers, Germany, and England. He also excels in painting, and has published works on the two arts.

ETH'ELBALD, d. 869; King of Wessex; son of Ethelwulf, king of the Anglo-Saxons. Ethelbald formed a conspiracy to seize his father's throne, but was dissuaded on being given the rule of Wessex only. He married his young stepmother, Judith, daughter of the king of France, but the displeasure of the church and of the people compelled them to separate, and she went into a French convent, from which she eloped with Baldwin of the iron arm, and from their union came Matilda, wife of William the conqueror. The reign of Ethelbald was uneventful.

ETHELBERT, d. 866; King of the Anglo-Saxons. He was a son of Ethelwulf and ruled all the kingdom except Wessex, succeeding to that portion also on the death of his brother Ethelbald. It was during Ethelbert's reign that the Northmen, under the famous Ragnar Lodbrok, ravaged Kent, sacked the city of Winchester, and threatened London.

ÆTHELRED, or **ÆTHELRED**, I., d. 871; King of the Anglo-Saxons, succeeding his brother Ethelbert. He assumed the rule in 866, and his short reign was greatly disturbed by the forays of the Northmen under the sons of Ragnar Lodbrok. Ragnar had been captured and thrown into a den, where he was stung to death by serpents. His sons vowed vengeance. They seized the city of York and killed the princes who had captured their father; passed the winter in Nottingham, marched into East Anglia, destroyed several monasteries and nunneries, and killed Edmund, the king of East Anglia, of whom the church made a martyr. They were at last defeated by Ethelred, assisted by Alfred (afterwards the great), but two weeks afterwards they defeated Ethelred and Alfred at Basing. Ethelred died of a wound and Alfred became his successor.

ÆTHELRED, or **ÆTHELRED**, II., **THE UNREADY**, 968-1016; King of the Anglo-Saxons; son of Edgar and Elfrida. Careless of everything save his immediate comfort or whim, he and his kingdom were managed by unworthy favorites. In his time the Danes made many conquests in England, and forced Ethelred to purchase peace, to do which he laid upon his people the oppressive tax known as the "Danegeld," which was enforced at times for nearly 200 years. The Danes ravaged all the country around the river Humber, and in 994, aided by Olaf king of Norway, they laid siege to London, but the city was saved through the valor of its people. The Northmen then attacked the southern coasts, but they were hindered by the defection of Olaf, who embraced Christianity and became Ethelred's ally. In the last three years of the 10th c., the Danes ravaged Kent, Sussex, and Wessex. In 1000 the Anglo-Saxon king, disregarding the enemy at home, invaded Normandy, where he was disastrously defeated; but he made a treaty, and married Emma, the daughter of the duke of Normandy. In the spring, he concluded a treaty with the Danes; but, on pretense that they were plotting treachery, the next winter he ordered the murder of all the Danes in England. Among the victims was Gunold, sister of Swend, king of Denmark. Swend was swift in his revenge, and for four years his army ravaged almost at their pleasure in England. In 1007, Ethelred again bought peace for a large sum of money. In 1009, Ethelred collected the "largest fleet that had been seen in the reign of any king," with the intention of driving the Danes from the sea; but the fleet was almost wholly destroyed by a storm; the Danes renewed their ravages, and the English suffered many defeats, until another peace was purchased for money in 1012. The next year Swend, with the largest fleet he had ever collected, sailed up the Humber and marched towards London; but he met such strong resistance that he gave up the plan of attacking the city, and turned off to Bath, where he was proclaimed king of England by the people, who were weary of Ethelred's incompetency and exactions. London soon acknowledged Swend, and the deposed Anglo-Saxon king fled to Normandy. Swend died in the spring of 1014, and Ethelred was re-called on promising to rule better in the future. In the same year he defeated Cnut (Canute), son of Swend, but in 1015 Cnut ravaged a large territory, and was about to attack London when Ethelred died.

ETHELWULF, or **ÆTHELWULF**, d. 858; King of the Anglo-Saxons, son of Eghert. Ethelwulf's reign was mainly occupied in wars against the invading Danes. In 855, E. made a journey to Rome, taking his youngest son (afterwards Alfred the great) to have him consecrated as his successor. In France he married Judith, a daughter of the king of the Franks (afterwards married to Ethelbald, her step-son). In consequence of the preferment of Alfred for succession, the eldest son, Ethelbald, planned a revolt, but was pacified on his father's giving him the kingdom of Wessex. See **ETHELBAHD**.

ETHER (*ante*). The ancients had a shadowy idea, or theory it may be called, in regard to the medium which we term cosmic, or luminiferous, ether. The ancient Greeks personified it, Æther being, according to Hesiod, the son of Erebus and Night, and the brother of Day. They also regarded this personification as the representation of the great force of the universe, as well as original matter, which, in a mysterious union with this force, evolved the worlds. The Orphic hymns speak of Æther as the soul of the world, the animator of all things, the great principle of life, the divine essence. The children of Æther and Day were the objects of the visible creation, the heavens with all their stars, the land, the sea. Æther was the lightest and the most active form of matter, and Day had the power of converting it into heavier and visible matter. It seems as though the human mind has the power, given it by the creator, of foretelling great truths afterwards to be demonstrated. Plato spoke of æther as being a form of matter far purer and lighter than air; so light that its weight cannot be ascertained because diffused through infinite space. It would at first appear surprising that the substance which Huyghens found it necessary to assume to demonstrate the laws of reflection and refraction, and particularly of double refraction, should not have been regarded by the greater portion of the scientific world as a reality, as a substance necessary for the performance of many physical phenomena. But Newton's emission theory of light,

or, perhaps it may more correctly be said, his elaboration of the emission theory of Descartes, held the belief of the world for nearly a century and a half, and this theory did not require the supposition of such a medium, although both Newton and Descartes conceived of its existence. Huyghens's undulatory theory was so thoroughly founded upon the doctrine of an ether that its opponents were perhaps, in their opposition to his theory, insensibly led to ignore the existence of this medium; for the propagation of light by the emission of particles of matter needed no medium for them to pass through; they could pass through vacuous space, although there were some phenomena which seemed to suggest that the assumption of such a medium would aid in their explanation. But Huyghens's theory required the existence of the medium, although, strange as it may seem, the great mathematician Euler, an advocate of the doctrine of undulations, rejected the doctrine of an ethereal medium. Prof. Grove, a modern British scientist, in his essay on the *Correlation of Physical Forces*, offers the following arguments, here briefly stated, against the doctrine of a cosmic ether. The tendency that the particles of bodies have to fly off into space is so great that it has been impossible hitherto to cause an inclosed space to be void of ponderable matter. Gaseous matter has so strong a tendency to fly off into space that no part of the universe could, after a time, be free from its particles. Again, it must be assumed that light is lost in the interstellar spaces, because, if it were not so, there could be no night, all of the stars being suns. Now, an argument which chimes in with the doctrine of the correlation of physical forces, is that the light from these innumerable suns is transmuted into another force, and this requires the existence of matter in the spaces, such matter as would be furnished by the expansion into space of the aerial matter which envelops the different worlds. The strongest arguments in favor of the belief in a cosmic ether are that it allows of a perfect explanation of all the phenomena of radiation, refraction, diffraction and polarization of light, and that such explanation cannot be made without assuming the existence of such a medium. See HEAT AND LIGHT.

ETHEREGE, or ETHERIDGE, Sir GEORGE, 1636-89; b. London; educated at Cambridge, and traveled in the continent, where he saw some of Molière's dramas. After the restoration of Charles II, he began to write for the stage, producing first *The Comical Revenge, or Love in a Tub*, which was highly successful. He was at once admitted to the circle of wits and poets of the time, and led a careless and somewhat loose life. By a questionable alliance with Mrs. Barry, the actress, he had one daughter, who died young. Among Etheridge's plays were *She Would if She Could*, and *The Man of Mode, or Sir Fopling Flutter*, in which the chief character was a portrait of Beau Hewit, the Brummel of the period, while he represented in other parts Sir Charles Sedley, and also himself. But he fell to gambling and lost his fortune. Then he married a rich widow, and again had money. In 1686, he was appointed resident minister at Ratisbon, where it is said that while conducting a party of friends to the stairs after a banquet he fell over the banisters and broke his neck.

ETHNOGRAPHY, a term closely allied to ethnology (q.v.). Ethnography embraces the details, and ethnology the rational exposition, of the human aggregates and organizations known as hordes, clans, tribes, and nations, especially in the earlier, the savage, and barbarous stages of their progress. Both belong to the general science of anthropology (q.v.), or the natural history of mankind, being related to it as parts to a whole. Ethnography and ethnology, indeed, run up into anthropology as anthropology does into zoology, and zoology into biology. No very sharp line can be drawn between these two sciences themselves, their differences being mainly those between the particular and the general, between the orderly collection of local facts, and the principles according to which they may be grouped and interpreted. Ethnographers deal with particular tribes, and with particular institutions and particular customs prevailing among the several peoples of the world, and especially among so-called savages. Ethnologists bring simultaneously under review superstitions, legends, customs, and institutions which, though scattered in distant regions of the earth, have some common basis or significance. Ethnography and ethnology run as easily one into another as the two sections of general anthropology, viz.: 1, anthropology proper, as expounded by anatomists and physiologists, who deal with the different races of men, their elements, modifications, and possible origin; and, 2, demography, which, as constituted by the researches of Quetelet and his friends and disciples, as Farr, Galton, Guillard, and Bertillon, treats of the statistics of health and disease, of the physical, intellectual, physiological, and economical aspects of births, marriages, and mortality. Ethnography, ethnology, and anthropology are interwoven with philology, jurisprudence, archaeology, geography, and the various branches of history. A fact may require to be investigated successively by linguists, anatomists, and mathematicians. In current language, ethnography and ethnology are often used indiscriminately; but if a distinction be made between them, an instinctive perception teaches us to speak of ethnographic facts and ethnological theories, of ethnographic literature and ethnological science—ethnology being related to ethnography as the wine to the grape.

ETHYLENE, ETHENE, or BICARBURETED HYDROGEN. See OLEFIANT GAS, *ante*.

ET'OWAH, co. in n.e. Alabama, crossed by the Coosa river, and the Alabama and Chattanooga railroad; 650 sq. m.; pop. '70, 10,109—1708 colored. The surface is rough.

with extensive forests, and fertile soil. Productions, corn, cotton, wheat, etc. Co. seat, Gadsden.

ETRUSCAN LANGUAGE. See *ETRURIA*, *ante*.

ETTTLINGEN, the chief t. of the circle of Carlsruhe, Germany, on the railway between Mannheim and Basel, $4\frac{1}{2}$ m. from Carlsruhe; pop. '75, 5,286. It has manufactures of paper, cotton, starch, powder, etc. There is an old castle built on the site of a Roman fortress. Ettlingen was conquered in 1644 by Taupadel; and near the town, in 1796, Moreau was defeated by the archduke Charles. Roman antiquities are found in the neighborhood.

ETYMOLOGICUM MAGNUM, a Greek lexicon of unknown authorship, said to be the oldest extant in that language. It is thought to have been made in the 10th century.

EU, Prince LOUIS PHILIPPE MARIE FERDINAND GASTON D'ORLEANS, Comte d', b. France, 1842; eldest son of duke de Nemours and grandson of Louis Philippe. In 1864, he was married to Isabel, heiress-apparent of the throne of Brazil. He is a marshal in the Brazilian army, and was commander-in-chief of the allied forces in the war with Paraguay in 1869. He defeated Lopez, and proclaimed the abolition of slavery in Paraguay.

EUBULIDES, a philosopher of Miletus and contemporary of Aristotle, whose philosophy he attacked with great severity. Demosthenes is said to have been one of his pupils. He is not known to have written any independent work.

EUCALYPTUS (*ante*). Eucalyptus has recently had a popular reputation as an efficient remedy in intermittent fever. More than forty years ago the crew of a French war vessel were treated, it is said, successfully with eucalyptus, at Botany bay. Peasants of Valencia, a Spanish province, were found using it in 1867. Dr. Ramel, of Valencia, wrote of it to a brother physician in the highest terms as a febrifuge. In 1871, Dr. Keeler, a physician to some railways, reported that he found it as efficient as cinchona, and others have regarded it highly as a remedy for the pernicious form of intermittent (see *INTERMITTENT FEVER*). Other physicians do not find the same virtues, and others, again, account for this by the fact that different species have been employed; the *E. latifolius* failing where the *E. longifolius* succeeds. A report of Dr. Burdel of France, whose observations were made in the marshy department of La Sologne, where malarial fever prevails extensively, states that out of 123 cases only 11 were cured without relapse, and these were treated in a hospital. It was moreover observed that in those cases where the paroxysms were broken, the malarial cachexia remained. On the whole, the virtues which have been claimed for eucalyptus do not seem to be regarded by the majority of the medical profession as having been verified.

EUCHRE, a game of cards said to be of German origin, but now very popular as a social pastime in the United States. Thirty-two cards are used in E., the twos, threes, fours, fives, and sixes being rejected in a complete pack. Before the game is started the players cut for deal, which belongs to him who first draws a knave or the lowest card according to agreement. The non-dealer then cuts to his opponent, who deals five cards to each, by two at a time and three at a time or vice versa. The dealer turns up the top of the undealt cards for trumps. In suits not trumps the cards rank as at whist; in the trump suit the knave (termed the right bower) is the highest trump, and the other knave of the same color, either black or red (termed the left bower) is the next highest, this card being, of course, omitted from the suit to which it would otherwise belong. The other trumps rank as already stated, the queen being next above the ten. The best form of the game is when played by four persons, but two, three, or even more than four persons may play, if the rules be adapted accordingly. In two-handed euchre the non-dealer looks at his hand and decides whether he will play it. If he be satisfied and think he can make three tricks, he "orders up." The dealer then discards his lowest and least useful card, and is entitled to take the trump card into his hand; in this case, however, he must succeed in taking three tricks, or he is "euchred," and his opponent scores two points. If the non-dealer be not satisfied with his hand, he says "pass." The dealer then has the option of taking up the trump as before, or of passing also. If the trump be ordered up or taken up, the play of the hand commences; if both players pass, the dealer places the trump card face upwards underneath the pack, called "turning it down." The non-dealer has then the privilege of naming the suit which shall be trumps, which must be another than that previously turned up. If he "make" a trump, he must succeed in taking three tricks or he is euchred; but if he pass it again, the dealer has the option of making it. If both pass a second time, the hand is thrown up, and the other player deals. When the card turned up is red and the trump is made red, it is called "making it next;" the same with black. If the trump be made of a different color from the turn up, it is called "crossing the suit." If the hand be played, the non-dealer leads; the dealer plays to the card led. He must follow suit if able, otherwise he may play any card he pleases. If the left bower is led, a trump must be played to it. The highest card of the suit led wins the trick; trumps win other suits. The winner of the trick leads to the next. If a player make all five tricks he scores a "march," equal to two points; if he make three or four tricks he scores one point. In three-handed euchre the option of playing or passing goes to each in rotation.

beginning with the player to the dealer's left. Three cards, one from each hand, constitute a trick. The player who orders up, takes up, or makes the trump, plays against the other two, and if they succeed in euchring him, each of them scores two points. This is often termed "cut-throat euchre," because any one of the three players is liable to be opposed by the other two. Four-handed euchre is generally played with partners, who are cut for, and sit opposite each other as at whist; if a player have a strong hand he can decide to "play alone" single-handed against the two adversaries, and his partner cannot object. Should the lone player succeed in making a march he scores four; if he win three or four tricks he scores one; if he fail to win three tricks the opponents score two. The popularity of euchre in this country is due mainly to its simplicity and mirth-provoking qualities. It is played in many different ways, as the game is not bound by any strict set of rules. Sometimes a blank card called "little joker" or "the joker" is added, and is the highest card in the pack, the bowers following; sometimes it is agreed upon to allow the player who makes more than five points to carry the surplus (called a lap) to the next game; or to allow a "lone player" to call for his partner's best card.

EUCLASE, a silicate of alumina and glucina occurring in greenish crystals; it is hard, and will bear a high polish, but is fragile and not much used in jewelry. It is found in South America.

EUFAULA, a city in Barbour co., Ala., on the Chattahoochee, at the junction of the Montgomery and Eufaula, the Georgia Southwestern, and the Vicksburg and Brunswick railroads; 80 m. e.s.e. of Montgomery; pop. '70, 3,185. It is an important cotton shipping point, and has considerable manufacturing business.

EULENSPIEGEL, the hero of a *Volksbuch* or German popular comic tale, often alluded to by various old authors, entitled the *Story of Tyll Eulenspiegel*, which relates the freaks, pranks, drolleries, fortunes, and misfortunes of a wandering mechanic. "It were long to detail his fearful jokes, which sometimes brought him to the gallows, yet saved him from the halter. He was buried with his coffin standing on one end at Möllen, near Lübeck; and you may see his grave under the great lime-tree in the churchyard, and his rebus, to wit, an owl and a looking-glass, cut upon the stone." Ulen-spiegel, as he is sometimes called in German, has almost made the tour of Europe. His life was first published in the Nether-Saxon dialect, in 1483. Our English translation of *The merrye jests of a man that was called Howleglass, and of many marvelous things and jestes that he did in his life in Eastland*, was "Imprinted at London in Tamestreete, at the Vintre, in Three Craned Warfe, by Wyllyam Copeland."

A High-German version, the work of Thomas Murner, the Franciscan monk, was printed at Strasburg in 1519. A Latin translation was made by Nemius, and numerous French translations have appeared of the book. An English edition was published in 1860, under the direction of Kenneth R. H. Mackenzie, and with illustrations by Alfred Crowquill. There is no complete copy of the original, but portions in the royal library at Vienna and the royal library at Berlin complement each other.

EUMENES, 330-315 B.C.; a native of the Thracian Chersonesus; private secretary to Philip of Macedon, and also to his son Alexander the great, under whom he was a commander of the cavalry. After Alexander's death, the provinces and armies were divided among his generals, and the countries assigned to Eumenes were Cappadocia and Paphlagonia, with the sea coast of Pontus as far as Trapezus; but as they were not yet subdued, Leonnatus and Antigonus were charged by Perdiccas to put Eumenes in possession. Antigonus disregarded the order, and Leonnatus, having in vain endeavored to induce Eumenes to accompany him to the assistance of Antipater in Europe, made an unsuccessful attack on Eumenes's life. But Eumenes escaped and joined Perdiccas, who assisted him in getting possession of Cappadocia. He did not rule long, having the enmity of many powerful generals. He was betrayed by his own soldiers, and put to death.

EUNAPIUS, b. 347 A.D.; a Greek sophist, and enemy of Christianity. He possessed some knowledge of medicine, and was a teacher of rhetoric at Athens. He wrote *Lives of the Sophists*, and a continuation of the history of Dexippus.

EUNOMIUS, b. Cappadocia early in the 4th c.; leader of a sect of Arians who took his name. He was bishop of Cyzicus in 360, but was afterwards deposed for heresy by the bishop of Antioch. His writings were held in high esteem by his followers, and were so much dreaded by the orthodox that more than one imperial edict was issued for their destruction. His heresy was formally condemned by the council of Constantinople.

EUPHRANOR, a sculptor and painter of Greece in the 4th c. B.C. One of his finest works in sculpture was a figure of Paris, a copy of which is in the Vatican. His chief painting was extant at the time of Pausanias. It represented on one wall of a temple the twelve gods, and on the other wall Theseus as the founder of the equal polity of Athens.

EUPOLIS, b. 445 B.C.; an Athenian poet of the old comedy, ranking, in the opinion of Horace, with Cratinus and Aristophanes. It is said that he was thrown into the sea

by Alcibiades, who had suffered from his sarcasm; but, according to another account, he fell in either the battle at Cynossema, 411 B.C., or that of Ægospotami, 408 B.C. He was sufficiently great to have a quarrel with Aristophanes on mutual charges of plagiarism.

EUPOMPUS, a Greek painter of the 4th c. B.C., contemporaneous with Zeuxis and Parrhasius. When the sculptor Lysippus asked him whom he should take for his model, Eupompus replied, "Take nature herself for your model, and be not shackled by the trammels of any predecessor."

EURA'SIAN, from Eur (Europe) and Asia; a half-breed, offspring of an Asiatic mother and European or American father. This class is very numerous in the large cities of India, and at the ports open to foreign commerce in Burmah, Siam, China, and Japan. In India, they number 100,000. In person, they are usually handsome, well-formed, and, as a rule, learn the language of their fathers; but are not well esteemed by either natives or foreigners. By the laws of Japan and of Great Britain, the sons are citizens with their fathers, the daughters with their mothers.

EUREKA (Gr.), "I have found it." An exclamation attributed to Archimedes, the famous philosopher of Syracuse. Hiero the king sent a quantity of gold to a jeweler to be made into a crown. He suspected that the man had taken some of the gold and supplied its place with alloy. Therefore he asked Archimedes to test the work and determine the truth. The philosopher was just then stepping into his bath, and as he did so the water overflowed. The fact struck his mind that the water was displaced in ratio with the bulk of the object immersed, and suggested to his mind that, as a pound of gold was much smaller than a pound of silver, the trial of the crown in water would be a sure test. Convinced of the fact, he jumped from the bath, shouting "Heureka! Heureka!" and, without waiting to dress, ran home to prove the truth of his discovery.

EURIPUS, the channel between the island of Eubœa and the coast of Greece. Opposite Chalcis it is but a little over 60 yards wide and 7 or 8 ft. deep. There is a rock in the channel, on which stands a castle connected with both shores by bridges. This double bridge is said to have been built originally as early as the 4th c. B.C.

EUROCLYDON, the name given to a wind which caught the ship in which Paul undertook his voyage to Rome. Biblical scholars are not entirely agreed as to the term and its meaning; but it is evident that it was a n.e. wind, or e.n.e., with variable and fierce gusts from various points—similar to our *northeasters*. It was probably one of those violent gales now called *leanders*.

EUROPA, in Greek mythology, a daughter of Agenor or of Phœnix. Her beauty attracted the attention of Zeus, who appeared in the form of a white bull, and carried her to Crete, where she became the mother of Minos, Rhadamanthus, and Sarpedon. Her brother Cadmus, strictly charged not to return without her, set out with their mother (Telephassa) to find her. The mother died in Thessaly. At Delphi, Cadmus learned that he must follow a cow, which would guide him to the place where he must build a city. The cow lay down on the site of Thebes; but before he could offer the animal as a sacrifice to Athene he had to fight with a dragon which haunted a well. He conquered the dragon, and sowed its teeth over the ground. From the teeth sprang armed men who slew each other until only five were left to become the progenitors of the Thebans. Athene made Cadmus king of Thebes, and Zeus gave him Harmonia as his bride. The fate of Europa is not further recorded, but her name still lives in the designation of the continent of Europe.

EUROTAS, a river of Greece now called the Vasiliko, rising in the Arcadian mountains and falling into the gulf of Laconia. The cities of Sparta and Amyclæ were on this river, which was one of the streams to which the ancient Greeks paid divine honors.

EURYDICE, the wife of Orpheus. She died from the sting of a serpent, and her husband followed her into hades, where he so charmed Pluto with the music of his lyre that he was permitted to take Eurydice back to earth on condition that while on his way he would not look behind him. Just as they were near the entrance Orpheus could no longer refrain from casting a backward glance, which showed him Eurydice rapidly receding to the regions of the dead.

EUSTATHIUS, SAINT, a native of Pamphylia; bishop of Bœræ, and in 325 A.D. patriarch of Antioch. He was a zealous opponent of the Arians, who contrived to have him deposed on charges of heresy and unfaithfulness to the vows of celibacy. He was banished to Thrace, where he died about 360 A.D.

EUSTIS, WILLIAM, LL.D., 1753-1825; b. Mass.; a graduate of Harvard; studied medicine under Dr. Joseph Warren; served as a surgeon in the revolutionary army, and in the hospitals. He was a member of the state legislature, a member of the council; twice a member of congress; secretary of war 1809-12; minister to Holland 1814; governor of Massachusetts in 1824, and died while in office.

EUTAW SPRINGS, BATTLE OF, Sept. 8, 1781; between the American revolutionists under gen. Greene, and the British under col. Stuart. The British retreated, losing

about 630 men; the American loss was 535. The scene of the battle was about 60 m. n.w. of Charleston, S. C.

EUYUK, or **UYÜK**, a Turkish village in Asia Minor, 75 m. w.s.w. of Amasia. It has but about 20 houses, but is important as containing some of the most remarkable ruins in the east. They are the remains of a large building, and consist of colossal blocks of granite containing a great variety of sculptures very little defaced. The upper portion of the wall seems to have been formed of clay, as there are no remains of overturned materials. In form the building resembles an Assyrian palace, and has been conjectured by some to have been erected by the builders of the palaces of Nineveh, adopting in this instance, as they are known to have done in others, Egyptian figures and emblems. But not merely from the sphinxes, but also from the character of the human figures, Van Lempe considers that it was more probably a temple erected by Egyptians, who adopted an Assyrian form of building; and he conjectures that it dates back to the earliest Egyptian conquests in Asia Minor.

EVAGORAS, King of Salamis, 410 B.C. Isocrates says he was a just and wise ruler, who promoted the welfare of his people. He cultivated the friendship of the Athenians, and after Conon's defeat at Egospotami gave that officer a refuge. He made friends of the Persians, and assisted them and the Athenians in gaining the victory of Cnidus, 394 B.C. In 357, he was at war with the Persians, but soon made peace. He was assassinated 374 B.C.

EVA'GRIUS, b. Syria, 536 A.D. He was an advocate at Antioch, and the legal advisor of Gregory, the patriarch. The emperor Tiberius made him a quæstor, and his influence and reputation were such that on the occasion of his second marriage he was given a public festival, which, however, was interrupted by an earthquake, in which 60,000 persons are said to have perished. He was the author of a valuable *Ecclesiastical History*.

EVANGELICAL ALLIANCE (*ante*). This voluntary association of Christians belonging to various denominations and countries, had its origin in a general and strong desire for a more practical union among Protestants in order to promote the cultivation of Christian fellowship and the extension of Christian faith. After full conference and correspondence the alliance was formed in Freemason's hall, London, Aug. 19-23, 1846, at a meeting of about 800 persons, Episcopalians, Presbyterians, Independents, Methodists, Baptists, Lutherans, Reformed, Moravians, and others. Among these were many distinguished ministers and philanthropists from Great Britain, Germany, France, Switzerland, and the United States. The following doctrinal articles were adopted, not as a binding creed, but simply as an expression of the points of faith considered essential among those who are embraced in the alliance. 1. The divine inspiration, authority, and sufficiency of the Holy Scriptures. 2. The right and duty of private judgment in the interpretation of the Holy Scriptures. 3. The unity of the Godhead and the Trinity of the persons therein. 4. The utter depravity of human nature in consequence of the fall. 5. The incarnation of the Son of God, his work of atonement for the sins of mankind, and his mediatorial intercession and reign. 6. The justification of the sinner by faith alone. 7. The work of the Holy Spirit in conversion and sanctification. 8. The immortality of the soul, the resurrection of the body, the judgment of the world by our Lord Jesus Christ, with the eternal blessedness of the righteous and the eternal punishment of the wicked. 9. The divine institution of the Christian ministry and the obligation and perpetuity of the ordinances of baptism and the Lord's supper. The organization thus happily commenced has since been extended throughout Protestant Christendom. Branch alliances have been formed in Great Britain, Germany, France, Switzerland, Sweden, the United States, Australia, and among the missionaries in Turkey, India, Brazil, and Japan. These national branches are related to each other as members of a confederation having equal rights. The whole alliance appears in active operation only when it meets in general conferences having the character of Protestant ecumenical councils, but claiming only moral and spiritual power. These have already been held at London, 1851; Paris, 1855; Berlin, 1857; Geneva, 1861; Amsterdam, 1867; New York, 1873; Basle, 1878. The most enthusiastic and effective of these was the one at New York, when, for the first time, Christians from all parts of the earth met together in the new world to take counsel concerning the condition of Christendom, Christian union, Christian life, Christianity and unbelief, Christianity and error, Christianity and civil government, Christian philanthropy, and reform of social evils. The visible results of the E. A. may be seen, in part, in its promotion of religious liberty wherever that has been restricted or assailed. Since its organization several cases of persecution have occurred in southern Europe under the operation of penal laws against Protestants. In these cases the influence of the alliance has been successfully exerted to bring the persecution to an end. It has aided in bringing about the remarkable changes in favor of religious liberty which have taken place in Turkey within the last quarter of a century. It interceded for the Methodists and Baptists in Sweden, and that country has since abrogated its penal laws against dissenters. It sent a delegation in 1871 to the czar of Russia to plead for the Lutherans in the Baltic provinces, and since that time they have not been oppressed. It remonstrated against the persecution of Roman Catholic and other Christians in Japan, and the persecution has not been renewed. These instances

are sufficient to show that the power of Christian public sentiment, as expressed by the alliance, already commands a respectful hearing everywhere, and must, ultimately, be universally obeyed.

EVANGELICAL ASSOCIATION (*ante*), called sometimes, incorrectly, the German Methodist church, is a sect of American Christians, originally of German descent, formed under the influence of the rev. Jacob Albright, who, looking with regret on certain doctrines and habits prevalent among the German churches of eastern Pennsylvania, endeavored to reform them. A meeting of his converts in 1800 chose him as their pastor or bishop, and gave him jurisdiction as such over the members of the association. Subsequently annual conferences were established, and in 1816 a general conference, consisting of all the elders, met in Union county, Penn. Since 1843, general conferences, consisting of delegates from the annual conferences, have been held every four years. During its earlier years the E. A. was violently opposed, but for the last half century it has been quiet and prosperous. As it denounced slavery it made no progress in the southern states, but it has spread over the n., into Canada and even Germany. In theological doctrine it is described as endeavoring to blend Calvinistic and Arminian views; in polity, worship, and plans of work it resembles the Methodist Episcopal church; the ministers are divided into elders and deacons, the bishops (elected by the general conference) and the presiding elders (elected by the annual conference) continue in office four years, and may be re-elected. At first, preaching and other public services were conducted almost exclusively in the German language; now, however, the English also is employed. The denomination has a flourishing college at Plainfield, Ill. In 1878, it reported 19 annual conferences, 1400 preachers (itinerant and local), 1422 houses of worship, 401 parsonages, 103,000 church-members, 1846 Sunday-schools with 132,625 teachers and scholars, \$85,400 contributed to missions and other departments of benevolent work.

EVANGELICAL CHURCH CONFERENCE is the name given to periodical meetings of the Protestant churches of the German states, the holding of which was suggested by king William of Württemberg in 1815. The first was held at Berlin in 1846 and included representatives from nearly all the German states. At the second, held at Eisenach in 1852, a central organ was established at Stuttgart. From 1855 to 1868, the conferences were held at Eisenach.

EVANGELICAL COUNSELS are given by the Roman Catholic church when it recommends certain things to any one who is willing to practice them, not as in themselves obligatory, but as conducive to the attainment of superior holiness. Among them the principal are celibacy, poverty, and submission to monastic rules. Some writers include under this title various Scripture directions, such as "Resist not evil;" "If any man will sue thee at the law and take away thy coat, let him have thy cloak also;" "Whosoever shall compel thee to go a mile, go with him twain."

EVANGELISTS, SYMBOLS OF THE FOUR. For Matthew: a man holding a pen and scroll, looking over his left shoulder at an angel; Matthew's was the first gospel, and the angel represents the dictator of it. For Mark: a man writing, and at his side a winged lion couchant, emblematical of the resurrection which is most fully described by this evangelist. For Luke: a man with a pen looking over a scroll, and near by an ox or cow chewing the cud; the latter figure refers to the eclectic character of the third gospel. For John: a young man of delicate appearance, with an eagle in the background to denote sublimity. The more ancient symbols were: for Matthew, a man's face; for Mark, a lion, for Luke, an ox; for John, a flying eagle; all alluding to the four cherubim before the throne of God, described in the *Revelation*.

EVANS, FREDERICK WILLIAM, b. England, 1808; came to the United States in 1820; returned to England, and became interested in Owen's theories and joined the Shakers. Returning to America, he soon became a leader of the Shakers in this country, residing at New Lebanon, N. Y. He has published a number of works on the history and doctrines of that peculiar people. As a leader he has excellent faculty; as a writer his earnestness and a certain sharpness of style mark him as the chief polemic of his sect.

EVANS, MARIAN (*ante*), was the daughter of a poor clergyman, but in early life was adopted by a wealthy clergyman, who gave her a first-class education. When she left school, while she was still very young, Mr. Herbert Spencer became her tutor and friend, and, under his training, her mind was developed rapidly and broadly. She applied herself to languages, mastering German, French, and Italian; became an accomplished musician; and familiarized herself not only with the fine arts, but also with metaphysics and logic. While in this stage she translated Strauss's *Life of Jesus*; and soon afterwards became one of the staff of the *Westminster Review*. Here, by her intimacy with Mr. John Stuart Mill and others, she became confirmed in their peculiar religious and philosophical views. She was known as the wife of George Henry Lewes (q. v.), who d. 1878. Early in May, 1880, she married John Walter Cross, a rich English merchant, 10 or 15 years her junior. Died suddenly Dec. 22, 1880.

EVANS, OLIVER, 1755-1819; b. Del. He was apprenticed to a wheelwright, but soon displayed uncommon inventive genius. When 22 years old he invented a machine for making card-teeth which superseded hand work. He made the first high-

pressure steam-engine and the first steam dredging machine used in this country. This machine was put on wheels and propelled itself to the Schuylkill river, $1\frac{1}{2}$ m.; was fitted with a steam paddle-wheel and navigated the Schuylkill down to its junction with the Delaware. This is supposed to have been the first actual propulsion of a carriage on land by steam in America. He urged the construction of railroads with rails of wood or iron, but was hindered by limited means from carrying out the idea to any practical result.

EVANSTON, a village in Cook co., Ill., on lake Michigan, 12 m. n. of Chicago; reached by the Milwaukee division of the Chicago and Northwestern railroad; pop. of township, '70. 3,062; in '80. 6,703. Evanston is the seat of Northwestern (Methodist) university, the Evanston college for women, and the Garrett biblical institute. It has a beautiful situation, many fine buildings, and social attractions of a high order.

EVANSVILLE (*ante*), a port of entry and city in Vanderburg co., Ind., on the Ohio river, midway between Louisville and Cairo; on the St. Louis and Southeastern, the Evansville and Terre Haute, and the Lake Erie, Evansville, and Southwestern railroads; pop. about 35,000. The city contains a custom-house, marine-hospital, opera-house, court-house, several public halls, and is the center of a very large trade in agricultural products. It is also important for manufactures.

EVARTS, JEREMIAH, 1781-1831; b. Vt.; graduate of Yale; admitted to the bar in 1806, and in 1810 became editor of the *Panoplist*, a religious journal in Boston. In 1812, he became treasurer of the American board of commissioners for foreign missions, and in 1821 corresponding secretary. When the *Panoplist* gave place to the *Missionary Herald*, he became editor of the latter, and by many essays and other contributions showed himself a most efficient advocate and organizer of Christian missions. He also wrote 24 essays on the rights of the Indians.

EVARTS, WILLIAM MAXWELL, LL.D., b. Boston, Feb. 6, 1818; son of Jeremiah. He graduated at Yale in 1837, and studied in the Harvard law school under justice Story and prof. Greenleaf; was admitted to the New York bar in 1841; deputy U. S. district attorney, 1849-53, during which period he became conspicuous in prosecuting persons engaged in filibustering expeditions to Cuba. In 1853, he was counsel for the state of New York in the Lemmon slave case. In the impeachment trial of president Johnson, he was the leading counsel for the defendant, and in 1872 he was counsel for the United States before the tribunal of arbitration at Geneva. He was then and still is president of the New York bar association. Among many noted cases in which he has appeared are the Parrish will case; the will case of Mrs. Gardner, mother of the widow of president Tyler; as senior counsel for Henry Ward Beecher in the Tilton suit; and as advocate (on the republican side) before the electoral commission. He has made many public addresses, such as the eulogy on chief-justice Chase, the centennial oration at Philadelphia, and at the unveiling of the statues of Webster and Seward in New York. He was an early and active member of the republican party. In July, 1868, he was appointed attorney-general of the United States, and in Mar., 1877, became secretary of state, which office he now holds. All his public work shows high scholarship and affluent thought.

EVERMERUS, or EUEMERUS, a Greek scholar of the latter part of the 4th c. A.D. He is noted chiefly for his *Sacred History*, founded professedly on archaic inscriptions which he had collected during his travels in various parts of Greece, and more especially on those observed on the temple of Jupiter Triphylanus, in the island of Panæa. In this work, he introduced a new method of interpreting the popular myths, asserting that the gods who formed the chief objects of popular worship were mortals who, as heroes and conquerors, had earned a claim to the veneration of their subjects. Till the end of the last century, there were many who accepted this system of Evemerus, and the early Christians especially appealed to it as a confirmation of their belief that the ancient mythology was merely an aggregate of fables of human invention. Evemerus was a firm upholder of the Cyrenaic philosophy, and by many ancient writers he was regarded as an atheist, because of his dissent from the prevalent polytheism. Of his work only a few fragments remain in a Latin translation by Ennius.

EVERDINGEN, ALBART VON, 1621-75; a Dutch painter of coast and inland scenery, particularly of Norway, where he suffered shipwreck. His favorite theme was a fall in a glen, with mournful fringes of pines interspersed with birch, and log huts at the base of rocks and craggy slopes. The water in his scenes tumbles over the foreground so as to entitle the painter to the name of "inventor of cascades."

F, Sir GEORGE, 1790-1866; b. Wales. He was employed in various engineering in India, was assistant to the chief in the trigonometrical survey of that on the chief's death became his successor. Afterwards he was surveyor-general. His achievements in surveys were of the highest order.

F, MOUNT, in the Himalaya range in Nepaul, Asia; the highest mountain earth, so far as known. A careful measurement in 1856 made its height 29,000 ft. or within 38 ft. of $5\frac{1}{2}$ English miles.

EVERETT, EDWARD, LL.D. (*ante*), b. Dorchester, Mass., April 11, 1794; d. Boston, Jan. 15, 1865; an American statesman, orator, and scholar, son of Rev. Oliver Everett. He was at one time a pupil in a Boston school, of which Daniel Webster, in the absence of his brother Ezekiel, was the teacher. In 1811, when only 17 years of age, he graduated at Harvard with the highest honors of his class. While an undergraduate he had the principal charge of a students' paper called the *Harvard Lyceum*. In 1812, he was appointed tutor at Harvard, and while thus employed, found time to prepare himself for the ministry. He was ordained pastor of the Brattle street church (Unitarian) in Boston, Feb. 19, 1814. As a preacher his career was brilliant, though brief. He resigned his pulpit at the end of 13 months, when not quite 21 years of age, having accepted the Eliot professorship of Greek literature at Harvard. To fit himself more completely for his new position, he went to Europe and studied for two years in the university of Göttingen, receiving the degree of Ph.D. He then traveled extensively in England and upon the continent, making special visits to Athens and Constantinople. In England he made the acquaintance of the most eminent men of that day, Scott, Jeffrey, Romilly, and Davy. His range of study during his residence abroad was wide, embracing not only the branches included in his professorship, but a close examination of civil and political law, and of the European systems of government. Upon his return in 1819, he entered upon the duties of his professorship, delivering at the outset a course of lectures on ancient Greece, its architecture and ruins, which he afterwards repeated in Boston. During the period of his professorship, which continued till 1825, he became the editor of the *North American Review*, to which he contributed a great number of articles. In 1824, in the presence of gen. Lafayette, he delivered the Phi Beta Kappa oration at Harvard, winning new fame by his thoughtful and eloquent presentation of the theme, "Circumstances Favorable to the Progress of Literature in America." On the 22d of Dec. of the same year, he delivered an oration at Plymouth that kindled for him a wide popular enthusiasm. In the same year (1824) he was elected to congress from the Cambridge district. He was subsequently re-elected for four successive terms, making his whole period of service in that body 10 years. During this whole term he was a member of the committee on foreign relations, and in the 20th congress its chairman. He also served on the library committee, and generally on that for public buildings. He was also a member of some important select committees. His familiarity with the science of government and with the public questions of the time, united with his high literary qualifications, and his acknowledged power as a speaker, fitted him for great usefulness in committees and upon the floor. Some utterances are on record which may be taken as early indications of his subsequent position on the question of slavery. On the 9th of Mar., 1826, he brought upon himself the rebuke of Churchill C. Cambreling, member from New York, but a native of South Carolina, for these words: "The great relation of servitude, in some form or other, with greater or less departure from the theoretic equality of men, is inseparable from our nature. Domestic slavery is not, in my judgment, to be set down as an immoral and irreligious relation. It is a condition of life as well as any other to be justified by morality, religion, and international law." "Sir, I am no soldier. My habits and education are very unmilitary; but there is no cause in which I would sooner buckle a knapsack on my back, and put a musket on my shoulder, than that of putting down a servile insurrection at the south." In 1835, he was elected governor of Massachusetts, holding the office by annual re-election until 1840, when he was defeated by a single vote. In his first message to the legislature, Jan., 1836, he took occasion to refer in deprecatory terms to the anti-slavery excitement of that day, and, alluding to the anti-slavery papers, which were almost universally denounced as "incendiary," he said: "Whatever by direct and necessary operation is calculated to excite an insurrection among the slaves has been held by highly respectable legal authority an offense against the peace of the commonwealth, which may be prosecuted as a misdemeanor at common law." As the governor was known to have at that moment in his official possession, to be communicated to the legislature, the official demands of several of the southern states for the enactment by northern legislatures of laws to suppress the anti-slavery societies and journals, this portion of his message created much excitement in the state, and intense alarm in the anti-slavery party. Remonstrances in large numbers, against the adoption of the proposed legislation, were sent to the legislature, and the remonstrants were accorded a public hearing before a special committee. After a severe struggle, the contemplated restriction of the freedom of the press was averted, and no effort was ever made to enforce the governor's suggestion in regard to proceedings under the common law for the same object. While in congress, Mr. E. was a constant contributor to the *North American Review*, and among his papers published therein, was one in which he very ably and successfully controverted the South Carolina doctrine of nullification. In 1841, he was appointed by president Harrison minister plenipotentiary of the United States to Great Britain. The news of this appointment reached him in Italy, whither he had gone for the purpose of engaging in historical work. He hastened to obey the call of his country, and entered at once upon the discharge of his official duties. The relations of this country with England at that time involved our minister in very grave responsibilities, which Mr. E. discharged in a manner creditable alike to the country and to himself. Returning home in 1845, he reluctantly accepted the presidency of Harvard university, giving the next

three years to strenuous labor in behalf of his alma mater. After his resignation, he established himself in Boston with the purpose of entering upon literary tasks long postponed. He prepared a collected edition of his own orations and speeches, which appeared in 1850. He also edited a new edition of the works of Webster, at his special request, and prepared a memoir of the author. From such congenial labors he was next summoned to fill the place of secretary of state in the cabinet of president Fillmore, made vacant by Mr. Webster's death. He held this position only four months, retiring at the close of president Fillmore's administration; but during this time several important questions of state received his careful attention. Before leaving the department of state he was elected to the U. S. senate. Feb. 8, 1854, he made a powerful speech in the senate in opposition to the abrogation of the Missouri compromise of 1820, which prohibited slavery in all the territories ceded by France to the United States n. of the line of 36° 30'. The object of this abrogation was to open to slavery the territories of Kansas and Nebraska. Mr. Everett having been a conspicuous supporter of Webster and the compromises of 1850, was in a position to make his influence felt upon this new issue, but the measure was carried in spite of his eloquent remonstrances. His health failing, he resigned his seat in the senate in May and retired to private life. After recovering his strength, he devoted himself for several years to the work of procuring funds wherewith to purchase Mount Vernon, the home and burial-place of Washington, to be held in perpetuity as a place of resort and pilgrimage. He prepared an eloquent discourse upon the life and character of Washington, which he delivered nearly one hundred and fifty times in different places in the country, devoting the proceeds to this object. He also engaged to contribute an article weekly for one year to the *New York Ledger* for \$10,000, to be paid by the proprietor to the Mount Vernon fund. The articles were afterwards republished in a volume entitled *Mount Vernon Papers*. Giving his time gratuitously and paying his own traveling expenses, he raised over \$100,000 in all for the Mount Vernon fund. He subsequently, by similar methods, obtained considerable sums for several public charities. In 1860, he was nominated for vice-president of the United States, with John Bell of Tennessee for president, by a small remnant of the whig party, which had fallen to pieces under the growing anti-slavery sentiment of that period. The ticket received 590,631 votes from a total of 4,662,170. When the rebellion broke out in 1861, he took his stand promptly among those who determined to maintain the union at every hazard. His patriotic addresses at this crisis were of great service, influencing as they did a large body of conservative men, who, like himself, had done all in their power to discourage and resist anti-slavery agitation. His oration at the consecration of the national cemetery at Gettysburg, Penn., Nov. 15, 1863, was a production creditable alike to his patriotism and his high literary ability. In the great crisis of 1864, when Lincoln was re-elected, Mr. Everett's name headed the list of presidential electors of Massachusetts, and his vote for Lincoln was the last act in his political career. Jan. 9, 1865, he spoke in Faneuil hall in behalf of the needy and suffering citizens of Savannah, and on the following Sunday, the 15th, he died. He received the highest literary honors from the great English universities as well as from his alma mater. He was a corresponding member of the institute of France, and enjoyed the friendship of the greatest men of his time in Europe and America. A statue of him by Ball stands in the Boston public library, and another, by Story, in the public garden.

EVERGLADES, a peculiar swampy region in s. Florida, in Dade and Monroe cos., about 160 m. long by 60 m. wide, s. of lake Okeechobee. The E. consist of a vast number of small and low islands, separated by channels in which the water is usually shallow. The islands are covered with dense thickets of pines, palmettoes, vines, and tropical shrubs, and the soil is very fertile. The water in the channels is concealed by tall grass. The country is almost entirely wild, and abounds in small game. A few Seminole Indians still inhabit the region.

EVERGREENS (*ant.*). The more plentiful and important of these beautiful trees and plants native in the United States are given in the following list:

White Spruce.....	<i>Abies alba.</i>
Hemlock.....	<i>Abies Canadensis.</i>
California Spruce	<i>Abies amabilis.</i>
Douglass Spruce.....	<i>Abies Douglassii.</i>
Mexican Spruce.....	<i>Abies Mexicana.</i>
Black Spruce.....	<i>Abies nigra.</i>
Red Spruce.....	<i>Abies rubra.</i>
Sabine's California Spruce.....	<i>Abies Sabini.</i>
California White Cedar.....	<i>Libocedrus decurrens.</i>
White Cedar.....	<i>Cupressus thyoides.</i>
Great Coned Cypress.....	<i>Cupressus macrocarpa.</i>
Mexican Cypress.....	<i>Cupressus Mexicana.</i>
Red Cedar.....	<i>Juniperus Virginiana.</i>
Great Flowered Magnolia....	<i>Magnolia grandiflora.</i>
Balsam Fir.....	<i>Abies balsamea.</i>
California Noble Fir.....	<i>Abies nobilis.</i>
White Pine.....	<i>Pinus strobus.</i>

Yellow Pine.....	<i>Pinus mitis.</i>
California Yellow Pine.....	<i>Pinus brachypterus.</i>
California Nut Pine.....	<i>Pinus edulis.</i>
Jersey Pine.....	<i>Pinus inops.</i>
Scrub Pine.....	<i>Pinus Banksiana.</i>
Pitch Pine.....	<i>Pinus rigida.</i>
Long-leaved Pine.....	<i>Pinus australis.</i>
Pond Pine.....	<i>Pinus serotina.</i>
Spruce Pine.....	<i>Pinus glabra.</i>
Mountain Pine.....	<i>Pinus pungens.</i>
Loblolly Pine.....	<i>Pinus taeda.</i>
Lambert's Californian.....	<i>Pinus Lambertiana.</i>
Red Pine.....	<i>Pinus resinosa.</i>
Bald Cypress.....	<i>Taxodium distichum.</i>
American Yew.....	<i>Taxus baccata Canadensis</i>
Florida Yew.....	<i>Taxus Floridana.</i>
American Arbor Vitæ.....	<i>Thuja occidentalis.</i>
Giant Arbor Vitæ.....	<i>Thuja gigantea.</i>
California Torreyæ.....	<i>Torreyæ Californica.</i>
Great California tree.....	<i>Sequoia gigantea.</i>
Redwood.....	<i>Sequoia sempervirens.</i>

EVIDENCE (*ante*), in law, embraces all statements which a court permits or requires to be made by witnesses in relation to matters of fact pertaining to the case on trial, and all documents produced for the inspection of the court. The former is distinguished as parol, the latter as written evidence. Again, evidence is either direct or circumstantial. When a witness testifies to a fact in issue from his own personal knowledge, his evidence is direct; when he swears to other facts, from which the existence of the fact at issue is inferred, it is circumstantial. Generally direct evidence has more force than circumstantial, though the latter is sometimes of such weight as to carry conviction to a court or jury. Both are to be taken with some allowance for possible mistake or falsehood on the part of the witness. Evidence must be relevant to the issue, though it may embrace incidents in themselves irrelevant, but which are among the necessary surroundings of the fact to be proved. The contents of a document must be proved by the document itself if it be accessible; if not, then by a certified copy, or by oral evidence; the law requiring the "best evidence" procurable in each case. When a contract has been reduced to writing, parol evidence cannot be admitted to prove its contents; still less can any variations of its terms be thus proved. Courts presume, until the contrary is proved, that a document was executed on the day of its date. Alterations and interlineations in a deed are presumed to have been made before execution, but in respect to wills the rule is reversed. When the law requires an instrument, e.g., a will, to be attested, it cannot be used in evidence unless one attesting witness be called to prove its execution if such a witness be alive and capable of giving evidence. If there be no such witness, then the signature of at least one attesting witness, and of the person executing the deed, must be proved to be in their respective hand-writings. A will thirty years old is held to prove itself; that is, there is a presumption in favor of its validity. The burden of proof lies on the person who asserts the affirmative. A presumption on the part of a court can be set aside only by evidence, and the burden of proof rests upon the party making denial. In criminal cases—in trials for murder, for instance—malice is presumed and requires to be rebutted by evidence. A person who has not been heard of for seven years, unless the circumstances are such as to account otherwise for his absence, is presumed in law to be dead. His wife may marry again without liability to punishment for bigamy. The effect of presumption is to establish against a party a conclusion which stands until he disproves it. In many states uninterrupted, undisputed possession for 20 years is held to establish a title to real estate. In some states a shorter period is sufficient. By the common law, if a wife commits a felony, other than murder or treason, in the presence of her husband, she is not criminally liable, it being assumed that she was under coercion. This rule is greatly restricted in practice in the United States. It is a rule of law, to which, however, there are some qualifications, that a witness cannot testify to what he has heard another say, but to only what he himself knows. One of the exceptions to this rule is that the dying declarations of a murdered person as to the causes of his death and the person who committed the murder may be given in evidence by one who heard them. If a witness testify in a trial, his evidence may be proved in a subsequent trial. When doubts arise respecting the boundaries of land, or the pedigree of persons, and the question is material to determine the issue before the court, traditional evidence—in other words, declarations made long ago by persons supposed to have had knowledge of the subject—is sometimes admitted. The ordinary witness is confined to statements of fact; he cannot give an opinion, or state the inferences he draws from the facts within his knowledge. An "expert"—one skilled in some art or profession—is allowed and even required to give opinions as to the significance of facts whose meaning is not fully understood by a court or jury; e.g., a chemist may testify as to the effects of certain

poisons upon the human system, or a surgeon may say whether in his opinion there has been malpractice in treating a wound. For reasons of public policy, the confidential communications between an attorney and client and between a husband and wife are excluded. "Secrets of state" and the deliberation of judges and juries are exempt from judicial investigation. A witness within the jurisdiction of the court is required to attend in person; if he be beyond the jurisdiction his testimony is taken by commission. Formerly parties to an action and others interested therein were not allowed to be witnesses, but they are now generally admitted, it being assumed that courts and juries will give due weight to the temptation which such witnesses may be under to swerve from the truth in their own interest. Persons of a defective understanding, or who are supposed to be insensible to the obligations of an oath, are held to be incompetent as witnesses. Persons convicted of an infamous crime are generally excluded. The tendency of law at present, however, is to widen the range of evidence as far as possible, and to regard many of the former grounds of exclusion as concerning not the admissibility but only the credibility of a witness. The party calling a witness is not allowed to ask him "leading questions"—i.e., questions which suggest their answers. The other party on cross-examination is not bound by this rule. A witness is not required to answer questions, when in doing so he must criminate himself. A witness may be impeached by proving that his reputation for truth and veracity is bad.

EVIDENCES OF CHRISTIANITY. Christianity is the religion growing out of a divine revelation the giving of which, in successive stages, extended from a remote period in the past to about one hundred years after the birth of Jesus Christ. From the beginning of the revelation to the present time it has been engaged in severe conflicts with the mightiest forces, and with whatever immediate outward result, it has maintained its hold on the human mind and has advanced in power. Thus the conflicts themselves become important factors in the strength of the evidences by which the authority of the revelation is upheld. 1. Moses, as a bearer of a part of the revelation, was brought into conflict with the Egyptians and inflicted on them, instrumentally, without human help, judgments and sufferings, the result of which was the deliverance of the Israelites from bondage, and the memorial of which is the Passover, instituted at the time and observed to this day by the Jews scattered over the world. 2. Moses came also into conflict with the barrenness of the wilderness, in providing for the sustenance of the Israelites, and with their turbulence and rebellion during their sojourn and wanderings there. The memorials of these conflicts are the wilderness itself, the law given there, and the Pentateuch written there. 3. Having traversed the wilderness, Moses, Joshua, and Israel were involved in a conflict with the nations of Canaan, on both sides of the river Jordan, the result of which was the conquest of the land; and the memorial of it is the land itself, illustrated by the book of Joshua, which (as has been said) bears a relation to Palestine as conquered by the Israelites, similar to that which doomsday book bears to England as conquered by the Normans. 4. Passing by minor conflicts between the Jews and the nations around them, we take notice of the great expedition of Sennacherib, king of Assyria, against them, and of its overwhelming defeat; to both which events the harmonious witnesses are the written records of the Jews and the sculptured records of Sennacherib. 5. Nebuchadnezzar, king of Babylon, desolated the land of Canaan, destroyed Jerusalem, burned the temple, and carried the Jews captive. The result of this judgment was their deliverance from idolatry, and the memorial of it is the book of Daniel with its splendid prophecies. 6. Cyrus, the conqueror of Babylon, might also have overwhelmed the Jews, but having been shown the prophecy of Isaiah, written 150 years before, in which he was mentioned by name and his success foretold, his spirit was stirred up to restore them to their own land. The memorials of the restoration were the temple rebuilt at Jerusalem and the synagogues erected throughout the land. 7. Alexander, in his rapid career of conquest, appeared before Jerusalem in anger against the Jews because they placed obstacles in his way. But when he was shown the prophecies of Daniel concerning the king of Grecia who was to conquer Persia, his anger giving way to joy, he treated the Jews kindly and placed many of them in the new cities that he built. Memorials of his change of feeling towards them were furnished by Jewish synagogues built in the Greek cities and the Jewish Scriptures translated into the Greek tongue. 8. Antiochus the great, one of Alexander's successors, seized Jerusalem and desecrated the temple by offering heathen sacrifices therein. His course awakened the zeal of the Jews and imparted new life and purity to their religion. A memorial of this reformation was furnished by the restoration of royal government to the Jews. 9. The Romans next obtained entrance into Jerusalem and established their power over the land. For a time they gave regal and vice-regal authority to Herod and his successors. Afterwards they made Judea a province and continued to hold it until, on the revolt of the Jews, they destroyed the city and the temple, and sold the inhabitants as slaves. In the midst of this Roman domination the crowning event of human history occurred—THE ADVENT OF JESUS CHRIST THE SON OF GOD; and the still-enduring memorials of it are Jerusalem trodden down by the Gentiles and the going forth out of it of Christianity, strictly so called, unaided by physical power, to gain possession of the world. 10. Its first conflict, in this form, was sustained by Jesus himself against the chief forces of the Jews among whom he came. His visible

power consisted in a holy and unselfish life, in words of instruction surpassing all that men have ever spoken, and in beneficent works transcending all that men have ever wrought. The first result of this conflict was, apparently, his defeat by the Jews, for, aided by the Romans, they accomplished the death of Jesus and his burial in a sealed and guarded tomb. But the conflict was renewed by his followers, who offered themselves as witnesses of his resurrection and produced conviction in the minds of thousands of Jews, while also they aroused hostility in the hearts of many others. As the preaching of "Jesus and the resurrection" spread into other cities and lands, the conflict with Jews was continued, producing, as before, conviction in many minds and also hostility in many hearts. And to this day, Christianity and the Jews are arrayed against each other in many lands. 11. Its next conflict was with heathenism in union with the state. Proclaimed, almost immediately, as a gospel for the nations, it was opposed by the adherents of all idolatrous religions rallying against it as a common enemy, and by the governing classes, whose jurisdiction in religious matters (as they thought) it usurped. Yet it prevailed from city to city and from land to land. Heathen temples were almost deserted, and the fires of sacrifice on their altars went out. Trophies of the victory were furnished by the acts and writings of the apostles, by the planting and growth of churches, the joyful death of martyrs, the courage of confessors, and the argumentative defenses of learned men. If at the moment of triumph, in the council of Nicæa, the presence of the emperor Constantine—assuming, in some sense, to be the head of the assembly—was a fatal mistake, introduced from the heathenism which he had as yet scarcely left, let it not be forgotten that many of the bishops who rose to receive him were marked with bodily mutilations or scars, the tokens of their idility to Christ. 12. The next conflict of Christianity was with philosophy. While it contended only with Jewish and idolatrous rites, philosophers treated it with contempt and easily remained ignorant concerning it. But in its advance it awakened the hostility of Celsus, Porphyry, and others, who attacked it as false and mischievous; and, on the other hand, Justin Martyr, its first great defender among uninspired men, wore a philosopher's robe. From this point forward Christianity continued to be opposed by many in the ranks of philosophers and to be corrupted by the admixture with it of the philosophic opinions prevalent around it. 13. Christianity contended, also, with barbarism rude and strong. In the ages that followed the inroad of the northern tribes on Rome this religion was the only power that held them in check, tempering their fierceness and finally subduing them to the obedience of faith. Yet here also, as in its contests with Judaism, paganism, and philosophy, it was itself corrupted by admixture with the opinions and habits of those who received it. 14. Its next great conflict was with Mohammedanism. The Saracens were overrunning Christendom with the sword and the Koran from the east and south, but in the west the barbarians who had become Christians broke their power and pounded the forces of Europe upon the Holy Land. And from those times to the present the "eastern question," in some form, has arrayed Christian Europe against Mohammedan rule. 15. The next great conflict was in Christendom itself. The corruptions which had been introduced from the worldly power of Rome, from heathen idolatries, philosophic opinions, and barbarian superstitions, accumulated and grew until Christianity became, in many respects, a baptized heathenism. But from itself, through the teaching of the recovered Scriptures, its own reformation was commenced and was followed by a conflict more extended and severe than any which had been waged against it before. And after more than three centuries and a half this conflict has not ceased. 16. Its next conflict, partly occasioned by the errors of Romanism and greatly aggravated by them, has been with infidelity in various forms. The Italian infidels of the 16th c. were witnesses against themselves by their hypocrisy and vice; the English infidels of the 17th and 18th centuries were driven back by many earnest writers; the French infidels of the 18th c. hastening on the revolution and greatly increasing its honors, condemned their own religious errors by their political crimes; the German infidels of the 19th c., striving to dissolve Christianity into fable by the power of criticism, have left its foundations as solid as before. 17. The great conflict of Christianity in the present century is with the gigantic forces of modern heathenism. Having commenced the work in the closing years of the last century, it has ever since steadily advanced with wiser counsel, more deliberate purpose, more thorough work, more liberal expenditure, and more enlarged success, to the overthrow of all false religions. A system of religion which has been contending so long against all these mighty forces; whose progress can be traced through 3,800 years, from the point where one man held its revelation as a promise of blessing for all the world, to the present time, in which millions enjoying the blessing themselves are pressing on the fulfillment among all nations—that system of religion must have more than human strength, it must be from God. The evidences by which its divine origin is established are co extensive with human observation, thought, and history. A portion of them may be classified as follows:

I. EXTERNAL PROOFS. 1. Miracles wrought by Moses, Christ, and the apostles. 2. Prophecies already fulfilled and yet to be fulfilled: concerning Nineveh, Babylon, Tyre, Egypt, Petra, Bashan, Moab, Philistia, Damascus; the Babylonian, Persian, Grecian, and Roman empires; concerning the Jews, their deliverance from Egypt, entrance into Canaan, captivity in Babylon, restoration to their own land, destruction of their temple

and capital city, with the long period during which it would continue trodden down by the nations, their wanderings and sufferings in many lands: concerning the Christian apostasy, the seven churches of Asia, and the unfolding of human history to the last days. 3. Historical testimonies to the genuineness and authenticity of the Scriptures.

II. INTERNAL PROOFS. 1. *Doctrines*. Concerning the being, perfections, and government of God; the origin of the worlds; the creation, nature, fall, sinfulness, redemption, and immortality of man. 2. *Moral and religious precepts*. The ten commandments; sermon on the mount; ethics of the epistles. 3. The person, character, and work of Jesus Christ; and the unity of all the Scriptures in him as the divine human Savior. In the Old Testament a deliverer is promised who would be one of the human race, yet would perform a work beyond human power; would descend from Adam, Abraham, Isaac, Jacob, Judah, David; would be born in Bethlehem, of a virgin mother, yet is eternal, the mighty God and Prince of Peace; would be subjected to humiliation, sorrow, suffering, death; and, because of these things, would be raised from the dead and exalted to the right hand of God as the Savior of men. The New Testament exhibits Jesus Christ as descended, in human nature, from Adam, Abraham, Isaac, Jacob, Judah, David, and born in Bethlehem of the virgin Mary; yet as in his divine nature the Son of God, Emmanuel, God with us; as subjected to humiliation, suffering, and the cursed death of the cross; yet rising again the third day and filling the New Testament, the church and heaven with his glory as God manifest in the flesh. This exhibition of Christ in all the Scriptures is a demonstration that he is the divine Savior and that they are inspired of God.

III. Experimental proof (combining both the external and internal) furnished by the rise and continued progress of Christianity and its effects on the character, condition, and hopes of mankind. Christianity contains a revelation from the living God, was founded by a living Savior, was embraced, through the power of the Holy Spirit, by living men, so that Christians existed before organized Christian churches, before the Christian Scriptures, before Christian customs, laws, or nations. Successive generations of Christians have been continued on the earth and have furnished living evidences of Christianity. The aggregate of Christian life, character, work, and influence throughout the world from the beginning to the present time is, to-day, the culmination of the proofs that Christianity is divine. See CHRISTIANITY, *ante*.

EVOLUTION. See SPECIES, (*ante*).

EWBANK, THOMAS, 1792-1870; b. England. He emigrated to New York in his youth, and was appointed commissioner of patents in 1849. He published, besides other works, a *Descriptive and Historical Account of Hydraulic and other Machines, Ancient and Modern; and Thoughts on Matter and Force*.

EWELL, RICHARD STODDARD, 1818-72; b. District of Columbia; graduated at West Point, served on the western frontier, on the coast survey, and in the war with Mexico—being engaged at Vera Cruz, Cerro Gordo, Contreras, Churubusco, Molino del Rey, and Chapultepec; was captain of dragoons in 1849, and was engaged on the Gila and Pinal Apache expeditions. He joined the southern forces in the war of the rebellion, serving in the Manassas campaign, at Blackburn's Ford and Bull Run, at White Oak Swamp and Cedar Mountain; was defeated at Kettle Run, was in the second battle of Bull Run, and was wounded in the Maryland campaign; became lieutenant-general in 1863, succeeding Stonewall Jackson. He was taken prisoner April 6, 1865, a few days before the close of the war.

EWING, FINIS, 1773-1841; b. Va.; one of the fathers of the Cumberland Presbyterian church. He was licensed to preach, and in 1803 was ordained by the Cumberland presbytery. His ordination not being recognized by the Kentucky synod, the presbytery being dissolved, and the action of the synod being sustained by the general assembly, he with two others, in 1810, formed the nucleus of the denomination known as the Cumberland Presbyterian church. In 1820, he removed to Missouri, where he died.

EWING, THOMAS, LL.D., 1789-1871; b. Va.; educated by his own exertions, and admitted to the bar in Lancaster, O., in 1816, soon becoming a prominent and successful lawyer in that state. In 1831, he was sent to the U. S. senate, where he soon became known as opposing the confirmation of Martin Van Buren as minister of England, and president Jackson's measures generally. In 1841, he was appointed by president Harrison secretary of the treasury. Disagreeing with president Tyler (who succeeded Harrison only a month after the latter's inauguration), Ewing, with all the other cabinet officers except Webster, resigned. Under president Taylor he was the first secretary of the new department of the interior, and when Fillmore succeeded Taylor he was appointed senator from Ohio for the unexpired term of Mr. Corwin, then appointed secretary of the treasury. He retired from public life in 1851.

EWING, THOMAS, JR., b. Ohio, 1829; son of Thomas. He was chief-justice of Kansas, and served in the union army during the war of the rebellion, rising to brevet-major-general of volunteers. He is a member of congress, where he is a leading democratic advocate of what are known as "greenback views."

EXCHEQUER TALLIES, seasoned wands of ash, hazel, or willow, formerly used for checking accounts in the English exchequer. The sum acknowledged was inscribed

on the tally, on the other side of which the same sum was inscribed in Roman characters, together with the payer's name. Notches marked upon the tally indicated by their form the class to which the account belonged. This tally was split, and the payer received one half, which he presented for payment, and which was first matched with the half remaining in the office. It is said that this rude device, which was retained till 1783, was a very perfect protection against fraudulent claims.

EXCITO-MOTOR ACTION. See NERVOUS SYSTEM.

EXECUTION ON CIVIL PROCESS (*ante*), the writ which directs and authorizes the officer to carry into effect the final judgment or decree of a court upon the person or estate against whom judgment has been given. It is usually, though not always, a writ for the recovery of money for debt or damages out of the estate of a defendant. Sometimes it is a writ for a defendant upon a judgment in replevin, for a return of goods with damages; and sometimes a writ for the recovery of costs only. An execution on civil process may be taken out as soon as judgment is pronounced, even before it is recorded. The execution, unless otherwise specially provided by statute, or unless a writ of error or some agreement of the parties be interposed, must be taken out within a year and a day from the time the judgment was signed. After that time execution cannot issue unless a *feri facias*, or *capias ad satisfaciendum*, was previously sued out. The writ is directed to the sheriff, or in case of his disqualification by interest or otherwise, to the coroner, who becomes responsible for its execution, and is liable for damages if he neglect his duty. He is authorized to sell the personal property of the defendant at auction, and apply the proceeds to the satisfaction of the judgment and the costs and charges of the proceedings; and if there be a surplus, it must be paid to the defendant. In general, lands are not subject to execution; but, after a levy has been made under the *feri facias*, they must be appraised by the sheriff's jury and delivered to the plaintiff at the valuation until the debt is paid out of the profits. Exemption is made of certain property from execution for debt, as, for instance, household furniture, necessary provisions and fuel for the use of the family, necessary wearing apparel, bedding, tools of trade, books, pictures, etc., and a homestead of a certain value. The laws of the several states in respect to such exemptions are not uniform in all particulars.

EXECUTION OF DEED (*ante*). A deed is executed when it is signed, sealed, and delivered; but to make it good against a subsequent purchaser it must be acknowledged before a magistrate and recorded by the officer appointed for that purpose. In some states two witnesses to a deed are required; in others, one witness is sufficient; in others still, the acknowledgment before a magistrate makes any witness unnecessary.

EXECUTIVE DEPARTMENT, the branch of the government to which is confided the duty of executing the laws; in distinction from the legislative department which enacts, and the judicial department which expounds them. In the U. S. government, the chief executive officer is the president; in the several states, the governors thereof. The secretaries of state, treasury, interior, war, and the navy, with the postmaster-general, and the attorney-general, are officers of the executive department under direction of the president. The law does not oblige him to consult them, but the custom has made them his counselors and advisers. In the different departments are numerous subordinate executive officers, known as assistant-secretaries, clerks, examiners, solicitors, auditors, controllers, commissioners, deputy-commissioners, directors, chiefs, superintendents, etc. There are also collectors of internal revenue (in districts), and collectors and surveyors of customs (in districts).

EXECUTOR (*ante*), a person to whom another man has committed the execution of his last will and testament. He may decline to act if he choose, in which case the court will appoint an administrator. But if he accept and enter upon the trust he cannot resign it without reason. In general, any person capable of making a contract may be an executor. His duties are to bury the deceased in a manner suitable to the estate left behind, to prove the will, take possession of the property of the testator, make an inventory of the same, collect the assets, and pay the debts and legacies. For this the law gives him all the powers of the testator. Generally an executor is required to give bonds for the faithful discharge of his duties.

EXETER, a village and one of the co. seats of Rockingham co., N. H., on Exeter river, and the Boston and Maine railroad, 51 m. n. of Boston; pop. of township '70, 3,437. The village is built around the falls, and the chief business is manufacturing, especially of cotton. Here is the richly endowed Phillips academy, which for generations has had a national repute, founded in 1781 by John Phillips; also the Robinson female seminary, with large endowment, and about 240 pupils. There is a good library belonging to the town. The place was settled in 1638 by the Rev. John Wheelwright, an exile from Massachusetts. It suffered greatly in the various Indian wars of the century, and 38 of its citizens died in the continental army. It is an attractive village, with cultivated society.

EXOSTOSIS (Gr. *ἐξ*, out of, and *ὀστέον*, bone), a bony tumor growing from some of the osseous structures of the body. See TUMOR.

EXPATRIATION, a voluntary change of residence and allegiance from one's native land to another country and government. Despotic governments have assumed the right to forbid such a change on the part of their citizens, but the United States recognizes the right of the individual citizen, at his own pleasure, to leave the country of his birth and make his home in a foreign land. Naturalization, however, is necessary to the complete transfer of allegiance. The United States defends the rights and liberties of naturalized, precisely as it does those of native citizens. A naturalized citizen of this country, visiting his native land, is protected by the American flag as though he had been born on American soil. Of course, this right of expatriation cannot be made a cover for a previous breach of trust, or the commission of any crime, in the place of one's birth; but the assumption that the law of his native land requiring him at a certain time of his life to do military duty, nullifies for the time being a man's right of expatriation, is not allowed by the United States. Thousands of young men leave the old world for the avowed purpose of avoiding military conscription, and the United States welcomes them to citizenship, with all its rights and obligations.

EXPIATION OR ATONEMENT, DAY OF, among the Jews, is the 10th day of the month Tisri (corresponding to a part of our Sept. and Oct.), observed annually as a day of humiliation and atonement for national sin: the only day of national humiliation which Moses prescribed. The commandment to observe it was three times solemnly given, and the religious ceremonies peculiar to it were definitely ordained. All the people were required to refrain from work as strictly as on the Sabbath, and to afflict their souls in remembrance of their sins. In this humiliation fasting was probably designed to be included, and has been strictly practiced. The chief significance of the observance, as also its heaviest burden, centered in the high-priest as the representative of the nation before God. 1. The seven previous days were spent by him in nearly total separation from all other persons, and in careful preparation for his special duties. 2. "During the whole of the seven days, as well as on the day of atonement" (according to the statements of the rabbins) "the high-priest had to perform the ordinary sacerdotal duties of the daily service himself." 3. It was the only day of the year in which even he was allowed to enter the most holy place. 4. He was clothed in the linen priestly vestments instead of the splendid robes which at other times distinguished him. 5. He offered sacrifice first for himself and his house, sprinkling the blood and burning incense before the mercy-seat. 6. He took two goats for the sin-offering in behalf of the people, presenting both before the tabernacle, and having cast lots to determine which one should die, sacrificed it on the altar and carried its blood within the veil; then having confessed over the head of the living goat all the sins of the people, he sent it away under the charge of a trusted man to be set free in an uninhabited part of the wilderness. By this double offering as parts of one sacrifice the two great facts of redemption were represented: 1st, that an atonement for sin was made to God; and 2d, that the burden of sin was removed from man. In modern times the Jews continue to observe the day, beginning the ceremonies with what can be regarded, at best, as only a mournful parody on the offering of the scape-goat, fasting strictly through the day, and closing the service by reading the Scripture command for sacrifices which they can no longer bring.

EXPLOITS, RIVER OF, one of the largest rivers in Newfoundland, rising in the s.w. part of the island and running n.e. to the bay of Exploits, into which it falls about 49° n. and 52° w. Steamers go up 12 m., and small boats can pass to within 50 m. of the s.w. coast. The valley is fertile and abounds in game, being sparsely settled as yet, and the river is bountifully supplied with fish.

EXPLOSIVES. There is a question as to the influence, direct or indirect, upon modern civilization of the introduction of explosive agents for the purpose of war. Some eminent authors have gone so far as to consider the invention of gunpowder as next in importance, in its ultimate effects, to those of printing and the application of steam power. However this may be, it is well to remember that explosive substances are now of immense utility in the arts of peace; indeed, it is not too much to say that without their aid many of the great engineering enterprises of the present day would either be impossible, or else have to be carried out at a vast additional expenditure of time and labor. The germ of all the knowledge which we possess of explosive reaction undoubtedly lay in the probably accidental discovery, many ages ago, of the deflagrating properties of the natural substance niter or saltpeter (KNO_3), when in contact with incandescent charcoal. By distilling niter with oil of vitriol, the alchemists obtained a corrosive fluid which they called *aquafortis*, now known as nitric acid (HNO_3), which parts with its oxygen even more rapidly than saltpeter; so that if the strongest nitric acid be poured upon finely powdered charcoal, the latter takes fire at the ordinary temperature. Somewhat less than half a century back, it was discovered by some French chemists that upon treating various organic substances, such as starch, the sugars, cotton fabrics, and even paper, with concentrated nitric acid under proper precautions, the chemical constitution of the substances underwent a great change, and they became endowed with violently explosive properties, while remaining for the most part unaltered in external characteristics. To this discovery we owe a distinct class of explosive compounds, the most powerful for practical purposes as yet known.

Examining into those principles of constitution and action which are more or less common to all explosive substances, we may define, for our purpose, the term "explosive" as the sudden or extremely rapid conversion of a solid or liquid body of small bulk into gas or vapor, occupying very many times the volume of the original substance, and, in addition, highly expanded by the heat generated during the transformation. This sudden or very rapid expansion of volume is attended by an exhibition of force, more or less violent according to the constitution of the original substance and the circumstances of explosion. Any substance capable of undergoing such a change upon the application of heat, or other disturbing cause, is called "explosive." The most explosive substances that are practically the most important essentially contain carbon, oxygen, and nitrogen, the last always existing in a state of feeble combination with the whole or part of the oxygen, and thus creating that condition of unstable chemical equilibrium which is necessary. When explosion takes place, the nitrogen parts with its oxygen to the carbon, for which it has a greater affinity, forming carbonic acid (CO_2) and carbonic oxide (CO) gases, the combination being accompanied with great generation of heat, and the nitrogen is set free. In most explosives there is also hydrogen accompanying the carbon, and by its combustion producing an extremely high temperature; it combines with part of the oxygen to form water in the form of greatly expanded vapor. Other subordinate elements are often present; in gunpowder, for instance, the potassium binds the nitrogen and oxygen loosely together in the state of saltpeter, and there is sulphur, a second combustible, whose oxidation evolves greater heat than that of carbon. When chlorate of potash is present, the chlorine plays the part of nitrogen, and is set free in the gaseous state. Two very unstable and practically useless explosive substances, the so-called chloride and iodide of nitrogen, contain neither carbon nor oxygen; but their great violence is equally caused by the feeble affinities of nitrogen for other elements, large volumes of gaseous matter being suddenly disengaged from a very small quantity of a liquid and solid body respectively.

Explosives may be conveniently divided into two distinct classes—(1) explosive mixtures, and (2) explosive compounds. The first class consists of those explosive substances which are merely intimate mechanical mixtures of certain ingredients, and which can be again separated more or less completely by mechanical means, not involving mechanical action. These ingredients do not, as a rule, possess explosive properties in their separate condition. There are, however, explosives which might almost be classed in both categories; for example, *picric powder* is composed of ammonium picrate and saltpeter, the former of which contains an explosive molecule, but is mixed with the latter to supply additional oxygen, and thus increase the force. If a substance that will burn freely in air, combining gradually with the oxygen of the atmosphere, be ignited in pure oxygen gas, the combustion will be much more rapid, and the amount of heat generated greater, at the ordinary atmospheric pressure. If it be possible to burn the substance in a very condensed atmosphere of oxygen, we can readily imagine the combustion as very greatly accelerated, and therefore increased in violence; this is what is ordinarily effected by an explosive "mixture." A combustible body and a supporter of combustion are brought into extremely close contact with one another by means of intimate mechanical mixture; also, the supporter of combustion, or oxidizing agent, is present in very concentrated form, constituting what may be termed a magazine of condensed oxygen, solid or liquid. In the case of the explosion of a definite chemical compound, the change may be considered as the resolution of a complex body into simpler forms. This is not, however, always the case when a mechanical mixture is concerned; gunpowder, for example, may be said to contain two elementary substances, carbon and sulphur, not in chemical union.

The chief explosive mixtures may be subdivided into "nitrate mixtures" and "chlorate mixtures." In the nitrates, the oxygen is held in combination with sufficient force to need a powerful disturbing cause to separate it, so that mixtures made from nitrates do not explode very rapidly, and their action is comparatively gradual; they are not sensitive to friction or percussion, and hence are to a great extent safe. Any of the nitrates will form explosive mixtures with combustible substances, but nitrate of potash (KNO_3) is the only one practically employed. The nitrate of soda, called "cubical" or Chili saltpeter, has been used, but absorbs moisture from the air so readily as to give very inferior results. Gunpowder may be taken as the representative of the nitrate explosive mixtures. *Picric powder*, above referred to, has been proposed by Abel for use as a bursting charge for shells, as being more powerful than a corresponding charge of gunpowder, equally safe as regards friction or percussion, and less hygroscopic; it consists of two parts ammonium picrate, and three parts saltpeter, incorporated, pressed, and finished very much as ordinary gunpowder.

The chlorates part with their oxygen far more readily than the nitrates, the strong affinities of chlorine for the metals coming into play, and consequently chlorate mixtures are very sensitive to friction and percussion, and explode with great violence; chlorate of potash, (KClO_3) is the only one used. Very many chlorate mixtures have been made, some of which are employed in fireworks. "White gunpowder" is a mixture of two parts chlorate of potash, one of yellow prussiate of potash, and one of sugar; it is exploded very easily by friction or percussion. The most important chlorate mixtures are those used for igniting other explosives, such as the composition for friction tubes

for firing cannon, percussion-cap composition, and percussion fuses for bursting shells on impact; it is sometimes mixed with sulphur, as a combustible, and sometimes with black sulphide of antimony, which gives a longer flame.

In an explosive "compound," the elements are all in chemical combination, presenting a definite explosive "molecule," which contains, so to speak, both the combustible and the supporter of combustion, in the closest possible union; we can therefore understand its action being much more sudden and violent than that of the most intimate mechanical mixture. The chief explosive compounds are formed from some organic substance containing carbon, hydrogen, and oxygen, by introducing into it, through the action of concentrated nitric acid, a certain portion of nitric peroxide (NO_2), in substitution for an equivalent amount of hydrogen. A new compound, differing outwardly very little, if at all, from the original substance, is thus formed, but in a very unstable state of chemical equilibrium, because of the feeble union of the nitrogen and oxygen in the NO_2 molecule. A slight disturbing cause brings into play the stronger affinity of the carbon and hydrogen for the large store of oxygen contained in the new compound. Gun-cotton and nitro-glycerine are the leading members of this group, being produced in a precisely similar manner, by the substitution of three molecules of NO_2 for three atoms of hydrogen (H). As those explosives will be elsewhere described in detail, we give the formation, as a representative member of the group, of nitro-phenol, or picric acid, by treating phenol, or carbolic acid, with a mixture of nitric and sulphuric acids, the latter being required to absorb the water and preserve the full strength of the nitric acid:



The formula of the product may be empirically written $\text{C}_6\text{H}_3\text{N}_3\text{O}_7$; it is, like gun-cotton and nitro-glycerine, a *tri-nitro* substitution product. Only the picrates, or salts of picric acid formed with potassium or ammonium, are used in practice, as possessing more force than the uncombined acid. From starch may be obtained, in a strictly analogous manner, an explosive called *xylodine*, which is a *bi-nitro* product, two molecules of nitric peroxide being substituted for two atoms of hydrogen. In the case of *nitro-mannite*, an explosive made from mannite, one of the sugars, as many as six molecules of the NO_2 are inserted. The number of nitro-substitution products is very great, many of them being more or less violently explosive. The fulminates are among the most violent of all explosive compounds, their chemical sensibility being very small. Sudden in action, their effect is great locally; thus they are well adapted to the purpose, for which alone they are practically used, of igniting or upsetting the equilibrium of other explosives. Fulminate of mercury is produced by adding alcohol ($\text{C}_2\text{H}_5\text{O}$), under great precautions, to a solution of mercury in nitric acid; a gray crystalline precipitate is obtained, very heavy (sp. gr. 4.4), and so sensitive to friction or percussion that it is kept in the wet state. The results of analysis show one atom of mercury, and two each of carbon, nitrogen, and oxygen; so that the formula may be empirically written $\text{HgC}_2\text{N}_2\text{O}_2$, or perhaps more correctly $\text{HgO.C}_2\text{N}_2\text{O}$; the chemical factor $\text{C}_2\text{N}_2\text{O}$ is called *fulminic acid*, but has never been produced separately. Opinions differ as to the precise "rational" formulae of the fulminates, some chemists considering their process of formation to be similar to that of the nitro-substitution products. It will be observed that two atoms of nitrogen take the place of hydrogen, being the ratio of combining proportions of those elements. The products of combustion are carbonic oxide, nitrogen, and metallic mercury, and the violence of action is due to the sudden evolution of a volume of gas and vapor very large in comparison with that of the substance, its density being so great. This fulminate enters into the composition used for percussion caps and electric fuses; its practical value has of late years been immensely increased by the discovery of its power, even in very small quantities, to produce the almost instantaneous decomposition of several explosive substances. Fulminate of silver is prepared in a similar manner, but, being far more sensitive, is of little practical value; it is employed, in very minute quantities, in making such toys as detonating crackers.

It may be generally concluded that the amount of force exerted by an explosive substance depends upon (1) the *volume of gas or vapor* produced by the transformation, compared with that of the original substance; and (2) the *temperature of explosion*, which determines the extent to which the gases are expanded, or their tension increased; or, in other words, the explosive force is directly proportional to the heat of combustion, and the volume of gas and vapor calculated at 0°C . and 760 mm. pressure, and *inversely* proportional to the specific heat of the mixed products. It has been supposed by Berthelot and others that the volume of gas produced may possibly be still further increased by the partial or total "dissociation" of the compound gases, at the high temperatures concerned; for example, that the carbonic acid (CO_2) may be decomposed into carbonic oxide (CO) and oxygen, or the aqueous vapor into oxygen and hydrogen. However, Nobel and Abel demonstrate that, in the former instance, the loss of temperature, consequent upon the absorption of heat by the decomposition, would more than compensate for the increase of volume by dissociation. It must also be remembered that, if the temperature be extremely high, so also is the pressure under which dissocia-

tion must take place. We may therefore consider that it has no sensible influence upon the explosive force.

It is most important to distinguish between explosive force and explosive effect, the latter in great measure depending upon the rapidity with which the metamorphosis takes place, while the same amount of force may be exerted suddenly or gradually. We may, therefore, consider that the explosive effect varies *directly* as the volume of gas produced and the temperature of explosion, and *inversely* as the time required for the transformation. But the time, and, to a certain extent, the products and temperature, will vary with (a) the physical state of the explosive substance; (b) the external conditions under which it is fired; (c) the mode of firing or exploding.

The physical or mechanical state of the explosive substance has a most important bearing upon the effect obtained from it. To prove this, it is only necessary to point to the very different results given by gunpowders made with the same proportions of the three ingredients, but varying in density, and in shape and size of grains or pieces. Gun-cotton is even more affected by variations in mechanical condition. In the form of loose wool, it burns so rapidly that gunpowder in contact with it is not inflamed; plaited or twisted tightly, its rate of combustion in air is greatly modified. This is due to the fact that the inflammable carbonic oxide, which is evolved by the decomposition from the want of sufficient stored-up oxygen to oxidize completely all the carbon of the gun-cotton, cannot penetrate between the fibers and accelerate the combustion, but burns with a bright flame away from the surface of the twisted cotton: when the yarn is yet more compressed by any means, the temperature is not kept up to the height necessary for the combustion of the carbonic oxide, so that it escapes unconsumed, abstracting heat, and yet more retarding the rate of burning. For the same reason, pulped and compressed gun-cotton burns comparatively slowly in air, even when dry; in the wet state, it merely smolders away, as the portion in contact with the fire successively becomes dried. Yet this same wet compressed gun-cotton can be so used as to constitute one of the most powerful explosives known.

It is well known that gunpowder behaves differently when in the open air and under strong confinement; not only the rate of burning, but even, to a certain extent, the products of combustion are altered. We have discussed the effect of tightly plaiting or compressing gun-cotton; but when confined in a strong envelope, the whole of the inflamed gas, being unable to escape outwards, is forced into the interstices under immense pressure, and the decomposition is greatly accelerated. The amount of confinement or restraint needed by any explosive depends, however, upon the nature of the substance and the mode of exploding it, becoming very much less as the transformation is more rapid, until it may be said to reach the vanishing-point. For example, the very violent explosive chloride of nitrogen is usually surrounded, when exploded, with a thin film of water. Abel states that if this film, not exceeding $\frac{1}{1000}$ in. in thickness, be removed, the explosive effect is much lessened. Nitro-glycerine, again, when detonated by a fulminate, is sufficiently confined by the surrounding atmosphere. By the same means, gun-cotton may be exploded unconfined, if compressed, the mechanical cohesion affording sufficient restraint. In the case of wet compressed gun-cotton, which can be detonated with even fuller effect than dry, the mechanical resistance is greater, the air-spaces being filled with incompressible fluid.

The manner in which the explosion is brought about has a most important bearing upon the effect produced. This may be done by the direct application of an ignited or heated body, by the use of an electric current to heat a fine platinum wire, or by means of percussion, concussion, or friction, converting mechanical energy into heat. A small quantity of a subsidiary explosive, such as a composition sensitive to friction or percussion, is often employed, for the sake of convenience, to ignite the main charge, the combustion spreading through the mass with more or less rapidity, according to the nature of the substance.

Although subsidiary or initiatory explosives were at first used merely to generate sufficient heat to ignite the charge, and are often still so employed, they have of late years received an application of far wider importance. Mr. Alfred Nobel, a Swedish engineer, while endeavoring to employ nitro-glycerine for practical purposes, found considerable difficulty in exploding it with certainty; he at length, in 1864, by using a large percussion cap, charged with fulminate of mercury, obtained an explosion of great violence. This result led to the discovery that many explosive substances, when exploded by means of a small quantity of a suitable initiatory explosive, produce an effect far exceeding anything that can be attributed to the ordinary combustion, however rapid, of the body in question; in fact, the whole mass of the explosive is converted into gas with such suddenness that it may, practically, be considered instantaneous. This sudden transformation is termed "detonation." Of the substances capable of producing such action, fulminate of mercury is the most important.

Some explosives appear always to detonate, in whatever manner they may be exploded, such as chloride and iodide of nitrogen; the explosive effect is therefore much greater than that of a slower explosive substance, although their explosive force may be less. Again, other substances, such as gun-cotton and nitro-glycerine, are detonated or not, according to the mode of explosion. Indeed, Abel has proved that most explosives, including gunpowder, can be detonated, provided the proper initiatory charge be

employed. Roux and Sarrau have divided explosions into two classes or orders—"detonations" or explosions of the first order, and "simple explosions" of the second order. They made a series of experiments with the object of determining the comparative values of various explosive substances, detonated, and exploded in the ordinary manner; the method employed was to ascertain the quantity of each just sufficient to produce rupture in small spherical shells of equal strength. The following table gives the comparative results for the three most important explosive substances:

	EXPLOSIVE EFFECT—	
	Second Order.	First Order.
Gunpowder.....	1 00	4 31
Gun-cotton or nitro-cellulose.....	3 00	6 46
Nitro-glycerine.....	4 80	10 13

These experiments, although valuable, cannot be considered as affording a precise method of comparison; the results would be affected, *inter alia*, by the impossibility of insuring that the shells were all of the same strength, a point of great importance, considering the very small weights of each explosive used; also, the rate of combustion, and therefore the explosive effect of gunpowder, is materially affected by its mechanical condition, so that different powders would give a varying standard of comparison. However, they afford fair evidence that, when detonated, gun-cotton has about six times, and pure nitro-glycerine about ten times the local explosive effect of gunpowder simply ignited in the ordinary manner; nitro-glycerine is usually employed in the form of "dynamite," mixed with some inert absorbent substance, so that its power is proportionately reduced.

The rationale of detonation is not yet understood. If the transformation were due merely to the mechanical energy of the particles of gas, liberated from the initiatory charge at a tremendous velocity, being converted into heat by impact against the mass of the explosive substance, then it would follow that the powerful explosive would be the best detonating agent. This, however, is not the fact; for a few grains of fulminate of mercury in a metal tube will detonate gun-cotton, whereas nitro-glycerine, although possessed of more explosive force, will not do so unless used in large quantities. The fact of its being possible to detonate wet gun-cotton is also a proof that the action cannot be due to heat alone. It would rather seem to be what prof. Bloxam terms "sympathetic" explosion. The experiments of Abel, as well as those of Champaign and Pellet in France, appear to indicate a vibratory action of the detonating agent upon the ultimate particles of the substance to be exploded. An explosive molecule is most unstable, certain very delicately balanced forces preserving the chemical and physical equilibrium of the compound. If these forces be rapidly overthrown in succession, we have explosion; but when, by a blow of a certain kind, they are instantaneously destroyed, the result is detonation. Just as a glass globe may withstand a strong blow, but be shattered by the vibration of a particular note, so it is considered by some authorities that, in the instance cited, the fulminate of mercury communicates a vibration to which the gun-cotton molecule is sensitive, and which overthrows its equilibrium; it is not sensitive to the vibrations caused by the nitro-glycerine, which only tears and scatters it mechanically. Although the action of detonation has been spoken of as instantaneous, and may practically be so considered, yet a certain infinitesimal duration of time is required for the metamorphosis; different substances possess, doubtless, different rates of detonation, for we can scarcely conceive of a mechanical mixture, such as gunpowder, being so sensitive to the action of the detonating impulse as a definite chemical compound, and the rate even varies slightly, for the same explosive, with its physical state. It has been shown by means of capt. A. Nobel's chronoscope, that compressed gun-cotton, when dry, is detonated at a velocity of from 17,000 to 18,000 ft. a second, or about 200 m. a minute; by using a small primer of dry gun-cotton, the same substance in the wet state may be detonated at the increased rate of from 18,000 to 21,000 ft. a second, or about 240 m. a minute.

The following table shows the potential energy, in foot-tons, calculated from the heat of combustion for each explosive, determined by Roux and Sarrau, in the experiments already referred to; that for gunpowder is the mean given by five kinds:

Explosive Substances.	Potential energy per lb. Foot-tons.
Gunpowder.....	480
Gun-cotton.....	716
Nitro glycerine.....	1129
Picrate of potash.....	536
Picrate of potash and saltpeter.....	615
Picrate and chlorate of potash.....	781
Chloride of nitrogen.....	216

The above figures naturally direct our attention to the small amount of work stored up in even the most violent explosive substance, compared with the potential energy of 1 lb. of coal, which is about 4,980 foot-tons. Nobel and Abel point out that this great difference is due not alone to the fact that the coal draws its oxygen from the air, but also to the necessity that the explosive should expend a considerable amount of work in

converting its condensed magazine of oxygen into gas, before it can combine with the carbon; further, with reference to the economical value of the work done, that the oxygen used by the coal costs nothing, whereas much expense is incurred in condensing the oxygen into the explosive substance.

The practical value of any explosive must depend greatly upon the object to be attained. It is essential to distinguish between explosive force and effect; the more sudden the action the more local will be the effect produced, and hence the very violent explosive substances are useless as propelling agents for heavy guns or small arms, since they would destroy the weapon before overcoming the inertia of the projectile. It is true that gun-cotton, prepared in various forms, and mixed with other substances to moderate its action, as well as a similar compound made from sawdust, an inferior form of cellulose, are sometimes used with small arms; but, in addition to a want of uniformity in action, the strain caused by such substances would be far too great in the large charges needed for heavy guns. Again, there are cases, even in mining or blasting operations, for instance, when it is desired to displace large masses of earth or soft rock, in which a comparatively slow explosive, such as gunpowder, would give better results than gun-cotton or dynamite. However, speaking generally, gunpowder in some one of its forms is far the most valuable as a propelling agent, while for destructive purposes, the last named substances are much more effective, especially when detonating.

The various explosives in common use are gunpowder in various forms; gun-cotton; nitro-glycerine; dynamite, or giant powder, and dualin. Others less used are Schultze powder, glyoxiline, lithofractor, Brugiere's powder, the chlorates, and the picrates. See GUNPOWDER, *ante*; NITRO-GLYCERINE, *ante*. Dualin was invented soon after dynamite. The patent describes it as consisting of "cellulose, nitro-cellulose, nitro-starch, nitro-mannite, and nitro-glycerine, mixed in different combinations, depending on the degree of strength desired in adapting its use to various purposes." A sample supplied by the inventor for trial at the Hoosac tunnel was found by analysis to consist of 60 per cent of nitro-glycerine and 40 per cent of washed sawdust, not treated with nitric and sulphuric acids. The best variety now manufactured is believed to be cellulose derived from poplar pulp, treated with nitric and sulphuric acids, and saturated with nitro-glycerine.

Having a less specific gravity than dynamite, dualin is inferior to it, bulk for bulk, in explosive energy. When soaked in water, it can be exploded only by a violent detonation, exceeding that of the ordinary fuse, and even then it loses more than half its power. It congeals at about 45° Fahrenheit, and in this state readily explodes, becoming so sensitive to friction as to make it dangerous to use in cold weather. In other respects its properties resemble those of dynamite.

Laws.—There are laws in most of the states regulating the storage and transportation of explosives, and city corporations and boards of underwriters have strict ordinances and rules on the same subjects. [This article is mainly an abridgment from *Encyclopædia Britannica*, ninth edition.]

EXPORTS. See IMPORTS and EXPORTS.

EX POST FACTO, in law, an act that operates retrogressively; a law passed after the commission of an act by which such an act may be punished. The constitution of the United States prohibits the passage of such laws, either by congress or by any other legislative body. Chief-Justice Marshall defines an *ex post facto* law to be one which rendered an act punishable in a manner in which it was not punishable when it was committed. Various decisions of the courts make this definition more specific, and hold as *ex post facto* any law which makes criminal an act which, done before its passage, was innocent; any law which makes a crime greater than it was at the time of commission; any law which inflicts punishment greater than was affixed to a crime when committed; any law which changes the rules of evidence as to an offense already committed and to the prejudice of a defendant. The constitutional prohibition of *ex post facto* laws applies to criminal and penal statutes only, and not to those which simply affect property.

EXPRESS, a business which has grown within the past quarter of a century to enormous importance. It was in the spring of 1839 that William F. Harnden advertised to take charge of money and small parcels to transmit between Boston and New York, and from his single carpet-bag has risen a system of inter-communication between places and persons that, for numbers of stations and length of route, is surpassed only by the post-office department. The all-embracing express reached across the ocean as early as 1855, and now this peculiar American institution extends literally to the ends of the earth. The most valuable articles are sooner intrusted to a responsible express than to government mails, for, in addition to ever-increasing care, there is a system of package insurance which secures the owner in almost any case of loss. The express business is too well known to need any particular description. It is estimated that the American express companies alone cover about 75,000 m. of road; make a travel of 400,000 m. per day; employ over 20,000 men, 4,000 horses, and have from 9,000 to 10,000 offices. A large proportion of the business is the collection of small sums for merchants, the C. O. D. packages implying "collect on delivery" the sum marked on the package as due.

EXTRADITION (*ante*), in the United States. The federal constitution provides that "a person charged in any state with treason, felony, or other crime, who shall flee

from justice and be found in another state, shall, on demand of the executive authority of the state from which he fled, be delivered up to be removed to the state having jurisdiction of the crime." As to foreign countries, E. is regulated by special treaties, and the United States has such treaties with Great Britain, France, the Hawaiian Islands, most of the states now forming the German empire, and with that empire, Austria, Sweden and Norway, Italy, Switzerland, Venezuela, the Dominican republic, Nicaragua, Hayti, and Mexico. These treaties provide for E. in cases of the higher crimes, such as murder, assault with intent to kill, piracy, arson, robbery, forgery, rape, embezzlement by public officers, burglary, etc. Proceedings in cases of E. are carefully defined and guarded by law. Political offenders, even though making war upon their own government, are not subject to extradition. There are some treaties made between the United States and several Indian tribes, recognized as nations or distinct communities, in some of which the Indians have stipulated to surrender to the federal authorities persons accused of crimes against the laws of the United States.

EXTRAVAGANTES CONSTITUTIONES, papal constitutions of John XXII. and some of his successors, supplemental to the "*Corpus Juris Canonica*." They got their name from the fact that they were not arranged in order with the other constitutions, but were "outside wanderers" from the general code.

EYCK, HUBERT VAN (*ante*), 1366-1426; the eldest of a remarkable Flemish family of painters. He gained his artistic reputation in Flanders. He was in the pay of Philip of Charolais until 1421. His masterpiece is "The Worship of the Lamb," the noblest creation of the Flemish school. This great composition is one of the chief illustrations of the solemn grandeur of art in the church of the 15th c.; correct in drawing, glowing in color, deeply earnest and simple, and instinct with religious sentiment.

EYCK, JAN VAN (*ante*), 1390-1440; brother of Hubert, and also a painter. He was for nearly all his life under the patronage of Philip of Burgundy. He produced a great number of portraits and compositions, often working with his brother. Most of Jan's productions were of a high order of merit, lacking the modern scientific perspective and his brother's stern religious feeling, but with brilliance of color, fine gradation of tone, minuteness of finish, and firmness of touch.

EYESTONE (see *OPERCULUM*). This article was formerly much used, and is still to some extent, to remove foreign substances from the eye. It is put under the lid, is moved around by the motion of the eye, and dust or cinders adhere to it and are taken out with it.

EYRE, CHARLES, b. England, 1817; a Roman Catholic priest in Newcastle, canon of the diocese of Hexham and Newcastle; vicar general; archbishop for the w. district, and in 1868, apostolic delegate for Scotland. He is now archbishop of Glasgow. He is the author of a *History of St. Cuthbert*.

EZEKIEL, BOOK OF (*EZEKIEL, ante*), consists of an *introduction* (chapters i.-iii.) reciting the glorious vision in the midst of which Ezekiel received his call to the prophetic office, his commission to Israel, and his encouragements from God; and *three principal parts*.

I. PROPHECIES AGAINST THE PEOPLE OF ISRAEL (chapters iv.-xxiv.), subdivided into 18 sections. 1. The siege of Jerusalem, represented by a picture drawn on a tablet; the prolonged transgressions of the people, by the prophet's continued reclining on his side; and the hardships they should suffer, by the eating of coarse and loathsome bread. 2. Judgments on the city by famine, war, and dispersion abroad, signified by hair and beard cut off, weighed, scattered, and burned. 3. Judgments against idolatry, with a promise that a remnant should be saved. 4. Captivity, inevitable and severe, under the emblem of a chain. 5. Transgressions of Judah, represented by the image of jealousy; and consequent judgments, typified by the scattering of fire, and the departure of the shekinah. 6. The captivity of Zedekiah, represented by the removal of household goods, and bread eaten with trembling. 7. False prophets reprov'd and threatened. 8. Idolatrous elders condemned. 9. The rejection of Jerusalem, represented by the burning of an unfruitful vine. 10. God's compassionate love, against which Israel had sinned, compared to kind care shown to a child cast out at its birth. 11. Judgments on Israel for turning to Egypt for help against Babylon, denounced under the emblem of two great eagles, one representing Nebuchadnezzar, and the other Pharaoh. 12. Judgment denounced on every transgressor for his own sins, contrary to the common proverb implying that children suffer for their fathers' faults. 13. Captivity of the Jewish kings, represented by lions pursued and captured, and of the Jewish people, by a vine scorched, torn up, and planted in the wilderness. 14. God's mercies to Israel, and their continued transgressions reviewed; and, while final forgiveness is promised to the penitent, impending judgments are declared. 15. A consumed forest represents Jerusalem destroyed, and a sharp sword, Nebuchadnezzar cutting down Ammonites and Jews. 16. Recital of sins committed in Jerusalem by all classes of the people, and judgments on them denounced. 17. Idolatries of Samaria and Jerusalem, and their punishment. 18. Dreadful destruction of Jerusalem again proclaimed.

II. PROPHECIES AGAINST VARIOUS NATIONS AROUND JUDEA (chapters xxv.-xxxii.), subdivided into three sections. 1. Against the Ammonites, Moabites, Edomites, and Phil-

istines. 2. Against Tyre (represented, in its beauty, wealth, and renown, as the anointed cherub on the mountain of God) with a promise of returning prosperity to Israel. 3. The destruction of Egypt foretold and illustrated by a recital of Assyria's glory and fall under the emblem of a cedar of Lebanon cut down.

III. PROMISES OF FUTURE DELIVERANCE TO ISRAEL (chapters xxxiii.-xlvi.) subdivided into 6 sections. 1. The prophet is compared to a watchman appointed to give warning of danger, and is exhorted to be faithful. While under the power of the prophetic spirit, being informed that Jerusalem had been taken by Nebuchadnezzar, he foretells the desolation of the land, and reproves the hypocrisy of the captives around him. 2. The rulers, civil and ecclesiastical, condemned as unfaithful shepherds, and a general restoration of the people promised under the guidance of the good shepherd, David the prince. 3. Judgments against Edom again foretold. 4. Promises of restoration renewed to Israel, under the emblems of fruitful mountains, sprinkled water, a new heart, dry bones raised to life, and two sticks united together. 5. Destruction of Gog and Magog, followed by blessings to Israel. 6. Vision of the temple, the returning glory of the Lord, the division of the land, the healing waters from the sanctuary, the portions of the tribes, the city with 12 gates whose name shall be, "The Lord is there."

EZION-GABER, or EZION-GEBER, the last station of the Israelites before coming to "the wilderness of Zin, which is Kadesh." It was subsequently the station of Solomon's navy; that at which Jehoshaphat's ships were broken. This port, of which no trace remains, is supposed to have been at the modern Ain-el Ghudyan, about 10 m. up the dry bed of the Arabah, and near Elath, or Berenice.

EZRA, BOOK OF (EZRA, *ante*), records portions of Jewish history after the captivity. It is divided into two parts, the first of which, comprising six chapters, contains: 1. The decree of Cyrus giving permission to the Jews to return to their own land and rebuild their temple. 2. The record of his restoration of the sacred vessels of silver and gold (numbering in all 5,400) which Nebuchadnezzar had taken from the temple and brought to Babylon. 3. The return of a portion of the people and their commencement of the work. 4. The obstacles placed in their way by men who had taken possession of the land, and, consequently, did not wish the Jews to be re-established in it. 5. When this opposition had continued more than 20 years, Darius Hystaspis, having found the decree of Cyrus, confirmed it and gave the Jews additional privileges and help by which they were enabled to complete their temple and re-establish divine worship. After an interval of nearly 60 years, the second part, comprising four chapters, contains: 1. The decree of Artaxerxes giving Ezra authority to proceed to Jerusalem, with all Jews who wished to accompany him, and re-establish the Jewish state. On this occasion, the king, with his counselors, added large sums of silver and gold to the free-will offerings of the people, and also directed his treasurers in the provinces intervening between Babylon and Jerusalem to furnish the expedition liberally with needed supplies. 2. The arrival of Ezra accompanied by about 1500 chief men and 200 priests and Levites. 3. The reconstruction of the religious and social state of the Jews in accordance with the law of Moses. This reformation included the very difficult work of annulling the marriages which many had made with heathen families of the land. The Jews have always maintained the canonical authority of this book, giving it an equal place with the Pentateuch, and comparing Ezra with Moses. Ezra is justly regarded as the author of the whole book, although in the first part, relating to the actions of others, he drew his materials from various sources; in the second part only he describes events in which he was an eye-witness, a prominent actor, and the chief director.

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FABA, a genus of plants to which belongs *faba vulgaris*, or *vicia faba*, the common bean of Europe. The beans generally cultivated in America are of the genus *phaseolus*.

FABER, CECILIA BÖHL VON, 1797-1877: a celebrated novelist of Spain, better known by her masculine pseudonym of FERNAN CABALLERO. She was educated in Spain and Germany, and became an accomplished linguist. In 1813, she returned to Cadiz, and the next year married capt. Planells, whom she accompanied to America, where she passed a number of years of her married life. Not long after the death of her first husband she was married to the marquis de Arco Hermoso, and was a frequent attendant at the Spanish court, where her beauty, vivacity, and wit were much admired. Her second husband died in 1835, and in 1837 she married señor de Arrom, a member of the bar. The union was unfortunate, and it is to the trials and disappointments of her later life that the world is indebted for her literary works. Washington Irving visited her, and encouraged her to pursue Spanish literature, but it was many years later before *The Family of Alameda*, her first work, was given to the public, nor was it until after her 60th year that she appeared as an author at all, and then under an assumed name. Her works soon became popular, and were translated into French and German, so that within ten years she gained a European reputation.

A collected edition in 13 vols. was issued from the Madrid press in 1859, and about the same time she was appointed governess of the royal children. Among the many schemes of her busy life was one for the prevention of cruelty to animals.

FABER, FREDERICK WILLIAM, D.D., 1814-63; b. England; educated at Oxford. He gave up his Calvinist views and became an enthusiastic admirer and follower of John Henry Newman. In 1841, he traveled on the continent, and recorded his observations in *Sights and Thoughts in Foreign Churches and among Foreign Peoples*. In 1845, he was converted to the Roman Catholic faith, and founded a religious community at Birmingham, called Wilfridians, after the name Wilfrid, which he had assumed. This community was ultimately merged in the oratory of St. Philip Neri, of which Newman was the head; and in 1849 a branch was established in London over which Faber presided till his death. He published a number of theological works, and edited the *Oratorian Lives of the Saints*, but it is mainly as a writer of fervent and deeply tender devotional hymns that he is known.

FABER, or LEFÈVRE, JACOBUS, 1450-1536; surnamed STAPULENSIS; b. Picardy; a pioneer of the Protestant movement in France. He was a graduate of the university of Paris, and professor in the college of cardinal Lemoine. Though his works were very obnoxious to the Roman church he was safe from persecution under the king's protection until the king was taken prisoner at the battle of Pavia. He was then formally condemned, and his works were suppressed; but on the return of Francis all such proceedings were stopped. Among his works were the *Physics*, *Metaphysics*, and *Ethics of Aristotle*; and *A Psalter* in five languages. In 1512, he issued a translation into French of the Epistles of St. Paul, and of the whole New Testament in 1523, of the Pentateuch in 1528, and in 1530 of the whole Bible. His work has been the basis of all subsequent French versions. He also published notes and comments constantly exalting the Bible above the church as the rule for human conduct. When the princess Margaret became queen of Navarre, she gave Faber an asylum beyond the reach of his persecutors, where he passed his old age in quiet.

FABIAN GENS. See FABIUS, *ante*.

FABRE, FRANÇOIS XAVIER PASCAL, 1766-1837; b. France; a painter, pupil of David. One of Fabre's earliest productions, "Execution of the Children of Zedekiah by order of Nebuchadnezzar," secured for him the great prize of the academy. It was supposed that he was privately married to the duchess of Albany, who at her death made him her sole heir.

FABRICE, GEORG FRIEDRICH ALFRED VON, b. 1818; commander of the German army which occupied France in 1871. He was for a long time in the service of Saxony; was secretary of war in 1866, and reorganized the Saxon army after the Prussian plan. He showed admirable administrative ability as well as military genius.

FABRICIUS, CAIUS (FABRICIUS) LUSCINUS, a Roman gen., elected consul 282 B.C., and again in 278. He was sent, after the defeat of the Romans by Pyrrhus, to treat for the ransom and exchange of prisoners. Pyrrhus endeavored to bribe him, but all offers were rejected. At a later period, he made peace between the Romans and Pyrrhus.

FABRICIUS, GEORG, 1516-71; b. Saxony; an archæologist. He made a minute examination of the antiquities of Rome, and wrote an elaborate work, so accurate in descriptions that many learned Germans believed it to be from the pen of some ancient writer. In 1553, he was appointed director of the college of Meissen, and held that office till his death.

FABRICIUS, JOANNES ALBERTUS, 1668-1736; b. Leipsic; a learned bibliographer. He stands pre-eminent among scholars for a series of literary catalogues entitled *Bibliotheca Latina*, *Bibliotheca Græca*, and *Bibliotheca Antiquaria*. He studied medicine, and afterwards theology; but most of his life was among books. A list of 128 of his works is given, of which, however, the greater part were merely edited.

FABYAN, or FABIAN, ROBERT, b. London, near the middle of the 15th c.; an English chronicler, alderman, and sheriff of London. His *Chronicle* extends from the time when "Brute entered first the ile of Albion" to the year 1485. The chief value of the work is its details of city government and ceremonial.

FACIAL NERVE, the seventh cranial nerve in Sömmering's classification, originating in the medulla oblongata, passing through the temporal bone, and issuing from the skull through the stylomastoid foramen. It then branches over the superficial portions of the face, and acts as the muscle of expression. It was formerly classed as a portion of the seventh nerve, the *portio dura*, the other portion being the *portio mollis*, or auditory nerve; according to Sömmering, the 8th pair.

FACIAL NEURALGIA, paroxysmal pains in the head and face, caused by a morbid state of the nervous center, which may be the result of lack of nutrition, of blood-poisoning, or of hereditary predisposition. It may also be caused by irritation from bad teeth, and by inflammation of the facial nerve.

FACIAL PARALYSIS, a paralysis of the facial nerve on which depends the power to move the muscles of the face. One or both sides of the face may be thus affected,

and the attack is quite certain to be attended with a partial or entire loss of the power of articulation.

FACTOR (*ante*), a man employed to sell the goods of another; in the United States usually called a commission merchant, because he has his compensation in a commission or percentage upon the goods he sells. He differs from a broker in that he has actual possession of the goods of his principal, and is empowered to deliver them to the purchaser precisely as if they were his own. He generally buys and sells in his own name, so that those dealing with him may not know whether he is owner or factor. Under some limitations for self-protection, he is bound by the instructions of his principal and responsible for damages arising from a violation thereof. A factor is entitled to his commissions only after he has rendered the full service by which they were to be earned. He is responsible to his principal for losses incurred by want of ordinary care and skill in the transaction of business. In the absence of particular instructions he must follow the established rules and methods of the business in which he is engaged. He cannot delegate his authority without express permission of his principal, except in conformity to general usage or by stress of peculiar circumstances. His discretion is large, but he is bound to use it with due regard to the interest of his principal. He cannot sell goods at a sacrifice for the purpose of obtaining his commissions and advances. It is generally held in the United States that a factor who has made advances upon goods acquires such an interest in them that the principal cannot take them out of his possession by a revocation of his authority. The latter can sell enough of them to reimburse himself, the principal having power over the remainder. In many American states, a factor is deemed to be the true owner in the sense that sales made by him to purchasers acting in good faith are valid. Generally he acts under what is called a "guarantee," or "commission," i.e., a commission received as a consideration for guaranteeing to the principal payment for the goods which he sells. A factor whose principal resides in a foreign country stands to purchasers, in most respects, in the relation of an absolute owner. If a factor commits any wrongful act in a sale, the principal has the right to recover his goods wherever he can trace them, unless they are in possession of one who purchased them in good faith.

FACTORY ACTS (*ante*), laws enacted for the protection of persons working in factories, limiting the hours of labor, limiting the age at which children are permitted to engage in such work, and requiring them to have a certain amount of school instruction. Legislation of this kind in states where factories abound has been deemed necessary for moral and sanitary reasons.

FÆSULÆ. See **FIESOLE**, *ante*.

FAGNA'NI, JOSEPH, 1819-73; an American artist. b. Italy. He studied in Vienna and Paris, and came to the United States with sir Henry Bulwer in 1849, and, in 1851, married an American wife. He returned to Europe and made portraits of a large number of public characters, among them Victor Emanuel, Abdul Aziz, Garibaldi, the empress Eugénie, and Ali Pasha. On returning to New York, he painted a series called "The Nine Muses."

FAGUS. See **BEECH**, *ante*.

FAHLCRANTZ, KARL JOHAN, 1774-1861; b. Sweden; a self-taught painter, whose landscapes were pronounced the best produced in his country.

FAIDHERBE, LOUIS LÉON CÉSAR, b. France, 1818. He began a military career in Algeria in 1844; was a captain in Guadeloupe in 1848; again in Algeria in 1851-52, and, in 1854, was made governor-general of the French possessions in Senegal. He largely extended the French territory, and greatly improved the government and property of the colony. To do this, he was compelled to wage a war of extermination against the prophet El-Hadji Omar, who had formed the project of driving out all foreigners and founding an immense Mohammedan empire in central Africa. The struggle ended in 1860, by the submission of the ambitious Omar. In the war with Germany, Faïdherbe had chief command of the army of the north. In 1871, he was a member of the national assembly. He is the author of valuable works on African geography and antiquities.

FAILLON, MICHEL ÉTIENNE, 1799-1870; b. Paris; a writer on theology. He was a Sulpician, and visitor to the homes of that order in America. He wrote several valuable books, chiefly on Canadian history.

FAILLY, PIERRE LOUIS CHARLES ACHILLE DE, b. France, 1810. He was in the army in Algeria in 1828; afterwards director of the military school at Toulouse. For services in the Crimean war, he was made gen. of division. In 1859, he was one of Louis Napoleon's aids, and was especially distinguished at Solferino. In the war with Germany, he commanded the 5th army corps. He was surprised and defeated at Beaumont, and his military career ended with the capitulation of Sedan.

FAIRBAIRN, PATRICK, D.D., 1805-74; was b. at Greenlaw, Scotland; graduated at the university of Edinburgh; he was settled, in 1830, as pastor in one of the Orkney islands; was transferred to Bridgeton, near Glasgow, in 1837, and to Saltoun in 1840. For some years he was a professor at Aberdeen, and in 1856, was chosen principal and

professor of theology and Greek exegesis in the Glasgow theological college of the free church. His most important writings are *Typology of Scripture*, highly esteemed as learned, judicious, and evangelical; *Prophecy; Hermeneutical Manual; Revelation of Law in Scripture; Commentaries on Ezekiel and the Pastoral Epistles*; a translation of Hengstenberg's commentary on the Revelation, and a portion of that on the Psalms.

FAIRBANKS, ERASTUS, LL.D., 1792-1864; b. Mass. In 1825, with his brother, he established a manufactory for scales in St. Johnsbury, Vt. Their work has a world-wide reputation. In 1836-38, he was a member of the Vermont legislature, and in 1852-53 and 1860-61, he was governor of the state. In all business and social relations he was a man of spotless fidelity and integrity. He was a liberal giver to religious and charitable objects.

FAIRCHILD, JAMES H., D.D., b. Mass., 1817; entered Oberlin college in 1834; was tutor in 1838; professor of languages in 1842; of mathematics in 1847; of theology in 1858; became president in 1866, and (1880) retains that office. He is the author of a work on *Moral Philosophy*, and articles on the education of women.

FAIRFAX, a co. in n.e. Virginia, on the Potomac, intersected by the Virginia Midland and Great Southern, the Richmond, Fredericksburg, and Potomac, and the Washington and Ohio railroads; 430 sq.m.; pop. '70, 12,952-4,284 colored. The surface is hilly, with considerable woodland. Chief productions, wheat, corn, oats, and butter. Washington's residence, Mt. Vernon, on the Potomac, 15 m. below Washington, is in Fairfax co. Co. seat, Fairfax Court-house.

FAIRFAX, JOHN CONTEE, Lord, b. Md., 1830; succeeded to the title on the death of his brother, the tenth lord. He resided in Bladensburg, Md., having formerly practiced medicine in Woodburne, Md. The Fairfaxes are Scotch peers, without a seat in the house of lords.

FAIRFAX, THOMAS, Lord, 1690-1782; born England; educated at Oxford, and known as writer for the *Spectator*. He came to Virginia in 1739 to look after the estate inherited from his mother, the daughter of lord Culpepper, governor of the province. He found nearly six million acres on both sides of the Blue ridge between the Potomac and Rappahannock. He employed George Washington (then but 16 years old) to survey the estate, and the intimacy then formed lasted through life, notwithstanding their radical differences in views of government. In the revolution Fairfax was on the side of England. It is said that the Yorktown surrender so wounded his national pride that it was the immediate cause of his death.

FAIRFIELD, the s.w. co. of Connecticut, bordering on New York and Long Island sound; intersected by the New York and New Haven, the Housatonic, and the Danbury and Norwalk railroads; 647 sq.m.; pop. '70, 95,276. The surface is moderately even, and the soil good, producing cereals, tobacco, butter, etc. Manufacturing is largely carried on, there being more than 800 separate establishments. Co. seats, Danbury and Bridgeport.

FAIRFIELD, a co. in central Ohio, traversed by the Cincinnati and Muskingum Valley, and the Columbus and Hocking Valley railroads, and the Ohio canal; 490 sq.m.; pop. '70, 31,138. Surface undulating, and soil fertile, producing corn, wheat, oats, hay, etc. Co. seat, Lancaster.

FAIRFIELD, a co. in central South Carolina, between Broad and Wateree rivers, crossed by the Charlotte, Columbia, and Augusta, and the Greenfield and Columbia railroads, 625 sq.m.; pop. '70, 19,888-14,101 colored. The surface is uneven, and the soil fertile, producing corn and cotton. Co. seat, Winnsborough.

FAIRFIELD, a t. and port of entry in Fairfield co., Conn., on Long Island sound and the New York, New Haven, and Hartford railroad, 51 m. n.e. of New York; pop. '70, 5,645. A part of the town has recently been annexed to the city of Bridgeport. The town has a number of villages of importance besides Fairfield, and Southport is the business center. Manufactures are the chief occupation of the people. The village was burned by Gov. Tryon in 1779.

FAIRFIELD, a city and seat of justice of Jefferson co., Iowa, at the junction of the s.w. branch of the Chicago, Rock island, and Pacific, and the Burlington and Missouri river railroads; 50 m. w.n.w. of Burlington; pop. 2,343. It has two institutions of learning, Parsons (Presbyterian) college and Fairfield (Lutheran) college; a court house, schools, and manufactures.

FAIR HAVEN (former town in Conn.). See NEW HAVEN.

FAIR HAVEN, a village in Bristol co., Mass., at the mouth of Acushnet river, on Buzzard's bay, reached by a branch connecting with the Old Colony railroad one mile e. of New Bedford, and 54 m. s. of Boston; pop. of township '70, 2,768. A bridge connects Fairhaven with New Bedford. There are several manufactories in the village.

FAIR HAVENS, a harbor on the s. coast of the island of Crete, the port of Lasaea, about 5 m. e. of cape Matala, and immediately e. of a bold headland, on the summit of which are the ruins of an ancient convent dedicated to St. Paul. On the s. of the harbor are two small islands, and between these and the shore there is safe anchorage. The

apostle Paul sailed from this port in Oct., 60 A.D., and was ship-wrecked on the island of Malta a few days afterwards.

FAIR OAKS, BATTLE OF. See CHICKAHOMINY.

FAIRS (*ante*.) There are in the United States no fairs of the kind so common in the old world; but the term is applied to a variety of exhibitions, especially of cattle and agricultural products. In a wider sense it includes exhibitions and sales for charitable purposes, and indeed, almost any show where people are expected to bestow patronage and make purchases. During the war of the rebellion, what were called sanitary fairs were held in many cities of the northern states to raise funds for the U. S. sanitary commission, and their success was something entirely unprecedented. Some of the net results were as follows: The New York Metropolitan fair, \$1,184,487.72; at Philadelphia, \$1,035,398.96; Brooklyn and Long Island, \$305,513.83; Boston, \$50,000; Baltimore, \$40,234.54, etc. The most universal fairs in this country are the annual cattle shows, which are held in more than half of the 3,500 counties in the union. The originator of agricultural fairs in the United States was Elkanah Watson, a prosperous merchant of Albany, N. Y. In 1819, the state legislature, mainly through his influence, appropriated \$10,000 a year for six years for premiums on agricultural products and family manufactures. In 1832, the state agricultural society was incorporated. The county societies report to the state society, and that body reports to the legislature. A similar system prevails in many other states. Besides these regular agricultural fairs there are such exhibitions as the fairs of the American institute, of the Franklin institute, of the Maryland institute, and of many other organizations.

FAITH, ANALOGY OF. See ANALOGY, *ante*.

FAITHFUL, EMILY, b. England, 1835. She was early presented at court, and introduced to fashionable life in London, but became interested in improving the condition of working women. In 1860, she established a printing office in which women were employed as compositors, with great opposition, but with the approval of the queen. In 1863, she issued the *Victoria Magazine*, a monthly advocate of her work, and in 1868, *Change upon Change*, a novel. She also delivered public lectures on the employments of women, lecturing in 1872-73 in the United States. In 1877, she began the publication of the *West London Express*, the type-setting being wholly by women. The success of this publication has led to the employment of large numbers of women, and the introduction of steam machinery into the office.

FAITH, RULE OF, is that which determines what man is to believe concerning his origin, duty, and destiny. I. Many persons, denying either the possibility or the fact of a supernatural revelation, maintain that human reason alone, as possessed by all persons of sound mind, is both the source, and ground of all religious knowledge and conviction of duty. II. Others, either denying or depreciating the authority of any external revelation, affirm that every man, in connection with his reason, yet as the enlightener of it, has an inward revelation—God with him—to which pertains the supreme authority, in the belief of truth and knowledge of duty. III. The Roman Catholic church, admitting that truth supernaturally revealed is the rule of faith, teaches that the revelation actually given is partly written (as contained in the Old and New Testaments and the Apocrypha) and partly unwritten (as treasured up in divine and apostolic traditions); and that, consequently, the rule of faith includes both Scripture and tradition. And, as the people cannot surely and perfectly understand either of these, the only authorized interpreter of them both is the church, the infallibility of which is vested in the pope. Thus, ultimately, for every Roman Catholic, the rule of faith is the teaching of the infallible pope of Rome; and this, practically, for the mass of the people, resolves itself into the dictum of the parish priest, from whom they are bound to receive whatever he tells them as the judgment of the pope. IV. Protestants believe that all extant revealed truth is contained in the canonical Scriptures of the Old and New Testaments; and therefore teach that these (received by every man, after due inquiry, as the word of God, and interpreted according to his own judgment, enlightened through the use of all accessible helps, human and divine) constitute *for* him the rule of faith. Among those holding this general principle of Protestantism there are recognized diversities, according as, on the one hand, the authority of the Bible—even in its letter—is intensified, or, on the other hand, the sphere of human reason in interpretation of its spirit is enlarged. Also to the *consensus* of the church are assigned differing degrees of authority in the interpretation of Scripture among different sections of Protestants.

FAIZÁBÁD, a division in British India comprising the districts of Faizábád, Gondá, and Bharáich; 7,671 sq. m.; pop. '68, 3,379,262, of whom 3,028,502 were Hindus.

FAIZÁBÁD, a district in Oude, British India, between the Gogra and Gumti rivers; 1649 sq. m.; pop. 1,024,092. Ajodhya, the capital of the ancient kingdom of Oude, so conspicuous in the Sanscrit epics, is in this district. In more modern times the district was the center of the nawab vizier's influence, and contained his capital until the removal of his court to Lucknow in 1775. The district is intersected by the Oude and Rohilcund railroad, and has important trade in rice, wheat, sugar, indigo, opium, etc.

FAIZÁBÁD, a city, the administrative headquarters in the district of the same name,

on the Gogra river, India. A suburb of the city is the old Ajodhyá, the ancient capital of king Daswratha, the father of Ráma, the hero of Rámáyana. Of this ancient city, said to have covered a large area, scarcely a trace remains. The city of Faizábád was founded about 1730 by Ali Khán, the first nawab of Oude, who made it his capital. The place rapidly grew in importance until 1775, when the court of Oude was removed to Lucknow. It then rapidly decayed, all the leading merchants, bankers, etc., abandoning the place. In 1839, Butter estimated its pop. at 100,000, but fast diminishing, owing to the exactions and oppressions by the native officials of the nawáb's government. At the time of the census in 1869, Faizábád contained only 37,804 inhabitants; but it is now again advancing in prosperity, and is rapidly becoming an emporium of trade. At the time of the annexation of Oude in 1856, Faizábád was made, and still continues to be, a large military station. On the outbreak of the mutiny in 1857, the cantonment contained two regiments of infantry, a squadron of cavalry, and a light field battery of artillery—all natives. Owing to their threatening demeanor after the Meerut massacre, many of the European ladies and children were sheltered by one of the great landholders of Oude, and others were sent forward to less disturbed parts of the country. The troops rose, as was anticipated, and although they at first permitted their officers to take boats and proceed towards Dinapur, a message was afterwards sent to a rebel force lower down the river to intercept the fugitives. Of four boats, one succeeded in reaching Dinapur safely, having passed the rebels unnoticed. Of the occupants of the other three boats, one person alone escaped. Faizábád is now a station for European as well as native troops.—[Condensed from *Encyclopædia Britannica*, 9th ed.]

FALABA, a t. in w. Africa, 190 m. n.w. of Freetown, in Sierra Leone, on the Fala river. It was founded by the Sulimas who revolted from the Mohammedan Foulas, and its warlike inhabitants soon attained supremacy over the neighboring villages and country. The town consists of 4,000 to 5,000 small huts arranged in clusters around squares or court-yards; and although built of clay, they are neat and in some instances even elegant.

FALASHAS (i.e., Exiles), the degenerate Jews of Abyssinia, found in considerable numbers in the provinces w. of Takazze. It is doubtful whether they are to be ethnologically identified with the seed of Abraham, or regarded, like the Khazars of the 8th c., as, for the most part, mere proselytes to Judaism. As to the date when the race or the religion was introduced there is no authentic information, one account carrying it back to the days of Solomon and his hypothetical son Menelek by the queen of Sheba, another to the time of the Babylonian captivity, and a third only to the 1st c. of the Christian era. That one or the other of the earlier dates is probably correct may be gathered from the fact that the Falashas know nothing of either the Babylonian or Jerusalem Talmud, make no use of the tephilin, and observe neither the feast of Purim nor the dedication of the temple. They possess—not in Hebrew, of which they are altogether ignorant, but in Ethiopic (or Geez)—the canonical and apocryphal books of the Old Testament; a volume of extracts from the Pentateuch, with comments, given as they think from God to Moses on Mount Sinai; the Te-e-sa-sa Sanbat, or laws of the Sabbath; the Ardit, a book of secrets revealed to twelve saints, which is used as a charm against disease; lives of Abraham, Moses, etc.; and a translation of Josephus called Sana Aihud. A copy of the Orit or Mosaic law is kept in the holy of holies in every mesgeed or synagogue. Various pagan observances are mingled in their ritual; every newly-built house is considered uninhabitable till the blood of a sheep or fowl has been spilt in it; a woman guilty of a breach of chastity has to undergo purification by leaping into a flaming fire; the Sabbath has been deified, and, as the goddess Sanbat, receives adoration and sacrifice, and is said to have ten thousand times ten thousand angels to wait on her commands. There is a monastic system, introduced it is said in the 4th c. by Aba Zebra, a pious man who retired from the world and lived in the cave of Hoharewa, in the province of Armatshoho. The monks must prepare all their food with their own hands, and no lay person, male or female, may enter their houses. Celibacy is not practiced by the priests, but they are not allowed to marry a second time, and no one is admitted into the order who has eaten with a Christian, or is the son or grandson of a man thus contaminated. Belief in the evil eye or shadow is universal, and spirit-raisers, soothsayers, and rain-doctors are in repute. Education is in the hands of the monks and priests, and is given only to boys. Fasts, obligatory on all above seven years of age, are held on every Monday and Thursday, on every new moon, and at the Passover (the 21st or 22d of April). The annual festivals are the passover, the harvest feast, the Baala Mazálat or feast of the tabernacles (during which, however, no booths are built), the day of covenant or assembly, and Abraham's day. It is believed that after death the soul remains in a place of darkness till the third day, when the first taskar or sacrifice for the dead is offered; prayers are read in the mesgeed for the repose of the departed, and for seven days a formal lament takes place every morning in his house. No coffins are used, and a stone vault is built over the corpse so that it may not come into direct contact with the earth. The Falashas are an industrious people, living for the most part in their own villages, or, if they settle in a Christian or Mohammedan town, occupying a separate quarter. They engage in agriculture, manufacture pottery, ironware, and cloth, and are especially sought after for their skill in

mason-work. Their numbers are variously estimated at from 80,000 to 200,000. [Largely from *Encyclopædia Britannica*, ninth edition.]

FALCIDIAN LAW, so called because proposed by a Roman tribune named Falcidius. It was enacted in the time of Augustus, 37 years before the Christian era, and provided that testators could dispose of only three fourths of their property by will, and that the remaining one fourth should go to the heir. The common law imposes no such restriction, but allows a testator to dispose of his whole estate among strangers, leaving his family unprovided for. In some of the American states there are laws restricting the power of the testator in making bequests to charitable institutions. In New York one half only of a man's property, after the payment of his debts, can go to charitable uses, if a wife, child, or parent survive.

FALCONER, HUGH, 1808-65; b. Scotland; botanist and paleontologist; graduated at Aberdeen, and in medicine from Edinburgh university. He went to India as assistant surgeon, where he became deeply interested in paleontology and geology. On his recommendation the culture of the tea plant was undertaken in India. In 1848, he was professor of botany in the Calcutta medical college. He was a member of many learned societies.

FALK, JOHANN DANIEL, 1768-1826; b. Germany. By the fame of a volume of satires, he made his way into the best literary society of the time. When the French invaded Germany, he went into the army, and so distinguished himself at the battle of Jena that he was made a counselor of legation. In 1813, he started a society for friends in necessity, and about the same period he founded an institute for the care and education of neglected orphan children, which subsequently became a free public school. In 1804, he published *Amphytrion*, a comedy, and *Prometheus*, a tragedy. For six years he published a satirical almanac, in which he so vigorously attacked the management of hospitals, that a movement for reform was begun and resulted successfully. In 1806, he founded a critical journal called *Elysium and Tartarus*.

FALK, PAUL LUDWIG ADALBERT, b. Prussia, 1827. He was the son of a Protestant clergyman, attended the Friedrich's gymnasium at Breslau, and studied law at the university of the same city. In 1847, he entered the state service of Prussia; in 1850, he was appointed state attorney at Breslau, and in 1853 state attorney at Lyk. In 1858, he was elected to the Prussian chamber of deputies, and served as a member of the committee on petitions, budget, and military affairs, 1858-61. In 1862, he was appointed counselor of the court of appeals in Glogau, Silesia, and in 1867 was elected to represent that district in the provisional parliament of the North German union. In 1868, he was permanently assigned as privy-counselor to the ministry of justice, and devoted himself zealously to the new codification of laws for the North German union, and afterwards for the German empire. In 1871, the emperor appointed Dr. Falk one of the representatives of Prussia in the federal council, where he acted as chairman of the committee of justice, and rendered important services in the reorganization of the system of legal proceedings. In 1872, Von Mühler, the secretary of state for ecclesiastical, educational, and medical affairs, resigned; and Falk was appointed his successor. In 1872, he introduced a law, which was passed Mar. 11 of the same year, according to which the supervision of all schools was declared to be the exclusive prerogative of the state. The law was carried against the united efforts of the Roman Catholic and conservative Protestant parties of the Prussian parliament. The bishops of the Roman church made a determined opposition to the new policy, instructing the clergy in a joint pastoral letter not to lay down their offices as school inspectors without previously consulting the diocesan bishop. In a memorial addressed to the government, they declared that they regarded this law as an encroachment upon the inalienable holy right of the church. Falk, however, continued by a number of measures to assert the exclusive right of the state to legislate in all school affairs. A rescript of June 15, 1872, excluded members of ecclesiastical orders and congregations from holding positions in the public schools. In May, 1873, an act was passed conferring upon the state the right of supervising Roman Catholic seminaries. It was required also that candidates for the clerical office should undergo a certain amount of secular training at the universities, and that every ecclesiastical appointment should receive the sanction of the secular authorities. A royal tribune for ecclesiastical matters was also set up. This legislation, which the pope denounced as invalid, was disregarded by the Roman Catholic bishops, and prince Bismarck, supported by Dr. Falk, imposed penalty after penalty in order to establish the supremacy of the state. Refractory bishops were imprisoned, deposed, and banished; the contributions of the government were withdrawn from the clergy who incurred its displeasure; religious orders were dissolved; and the administration of church property was taken from the clergy and invested in bodies of laymen. These measures have been famous as the May laws. Dr. Falk lost his seat for Berlin at the general election of members of the imperial parliament in July, 1878. Puttkamer, the present minister of ecclesiastical affairs, is of a more conciliatory nature, and, acting on instructions from prince Bismarck, he introduced a bill popularly known as the *Canossa* bill. This new bill is a great modification of the Falk laws, and was adopted July 14, 1880, in the diet, by only 206 against 202 votes. Its period is limited to Jan. 1, 1882. The most important concession consists in the permission granted to German clergymen to be educated

in institutions of learning over which the Prussian government has no control, and over which the Jesuits preside. The alleged motive was to relieve the distress of the Roman Catholic population, and to fill numerous vacancies created by former removal of refractory priests.

FALLING STARS. See **METEORS**, *ante*.

FALL RIVER (*ante*), a city and port of entry in Bristol co., Mass., near the boundary of Rhode Island, at the mouth of Taunton river where it falls into Mount Hope bay, 49 m. s. of Boston, reached by the Old Colony, the Providence, Warren, and Fall River, and the Fall River and New Bedford railroads; pop. '75, 45,340. It has more than 40 cotton mills, running nearly 1,300,000 spindles, and employing about \$15,000,000 in capital. There are also other important manufactures; a city library, about 20 churches, banks, etc. It was once a part of Freetown, and was incorporated separately in 1803. A few years later it was called Troy, but the first name was restored in 1834. The city charter dates from 1854. It has risen to be one of the most important manufacturing centers in the country. A line of large and splendid steamboats connects it with New York.

FALLS, a co., in central Texas, on Brazos river, intersected by the Waco branch of the Houston and Texas Central railroad; 795 sq.m.; pop. '70, 9,851—4,681 colored. The surface is hilly or rolling prairie, partly covered with forests of ash, cedar, oak, etc. The soil is fertile; chief products, cotton, corn, and cattle. Co. seat, Marlin.

FALMOUTH, a township in Barnstable co., Mass., on Buzzard's bay, and Vineyard sound, noted for the important harbor of Wood's hole, now called Wood's holl, and becoming popular as a watering-place. Pop. of township, '70, 2,237.

FALSE POINT, a harbor in the Cuttack district of Orissa, one of the best on the coast of India; lat. 20° 20' n., long. 86° 4' e.; the anchorage is safe, roomy, and completely land-locked. It is a regular port of call for Anglo-Indian coasting steamers. There is a large export trade with Mauritius, and other French colonies.

FAMAGOSTA, or **FAMAGUSTA** (*ante*). See **CYPRUS**.

FAMILY. See **ORDER**, *ante*.

FAMINES has been supposed to furnish a needful check upon an inordinate growth of population; and with that view, they have been deemed useful regulators of the universe. A table, recently prepared by Cornelius Walford, read before the statistical society of London in 1878 and 1879, and published under the title, *On the Famines of the World, Past and Present*, enumerates more than 350 famines which have occurred in history. It includes those mentioned in the Bible as afflicting Palestine and the neighboring nations in the time of Abraham (Gen. xii. 10), and of Isaac (Gen. xxvi. 1); the seven years' famine in Egypt; those in ancient Rome; those which have visited the three divisions of Great Britain; those of Europe in the middle ages; the 34 famines of India; and the terrible calamity which has lately ravaged northern China. The table does not claim to be exhaustive. Famines are known to have occurred in China, of which no details have been found; and similar instances have probably existed in Persia and elsewhere in Asia.

The paper teaches that famines have frequently resulted from want of human foresight, or the failure of human expedients. Analysis discloses the following causes of famine which might have been averted or ameliorated:

War.—It draws from their employments those who would be engaged in the cultivation of the soil; it withholds the labor necessary to gather the crops already produced; it often devastates the plains in order to starve out an enemy; it wastes and destroys at every step. At sea, it blockades ports, and diverts cargoes from their destinations; on land, it cuts off armies, cities, districts, from their supplies. Still further, war breeds pestilence; pestilence cuts off many who have escaped from the sword; the land lies uncultivated; the live stock dies; and desolation follows. Hence the sword, pestilence, and famine are now, as they have been in all time, three associated deadly enemies of the human race.

Defective agriculture may result from ignorance, indifference, or unsuitability of climate, or location. Where the produce of the soil barely meets the current requirements of the inhabitants, it is clear that either the failure of a crop, or a sudden influx of strangers, may produce at least temporary famine. The distress in Ireland in 1879-80 was due in a large degree to the failure of the crops. Potatoes, still the staple food of a large proportion of the population, are set down in the agricultural returns of 1879 at 1,113,676 tons, against 2,526,504 tons in 1878; and of turnips there were but 2,057,804 tons, as compared with 4,686,226 tons of the previous year. The loss in money value to Ireland from this unfavorable harvest was estimated at over \$50,000,000 as compared with 1878. This loss was distributed very evenly over the entire country, but its effect on the usually prosperous counties was only impoverishment, while it reduced to starvation those districts entirely dependent on this precarious article of food.

Deficient transportation was formerly a frequent cause of famines. Because of the bad state of the roads a famine has prevailed in one part of a country when there was a superabundance in another. The construction of canals, and subsequently of railroads,

has greatly relieved this difficulty. In India the late famines might have been overcome if not averted, but for the want of the means of transport.

Legislative interference has been another cause of famines. It is not contended that in periods of emergency government should not step in and endeavor to mitigate the necessities of the hour; notable examples of such temporary restrictive regulations were shown by the more enlightened nations of antiquity; but it is a great mistake to attempt to regulate commerce to the subversion of the great principles of supply and demand. As an instance, we may cite the corn laws of Great Britain, which were repealed only at the indignant demand of the nation as recently as 1846. There is no doubt that the corn laws often prevented exportation of grain; but they permitted its importation only when prices reached or exceeded certain predetermined limits. The Irish famine of 1845-46 hastened their repeal.

Currency restrictions which tend to debase the value of current money, and thereby to lessen its purchasing power, especially in times of scarcity. The obvious manner in which a debased currency of paper or metal may operate in periods of scarcity is, that its purchasing power in all dealings with other nations is lessened not only in the degree to which it has been debased, but even to a greater extent by the prejudice, or the want of confidence, which its known debasement has inspired. Thus, if a merchant seeks to buy grain abroad, where the coinage value will have to be measured in relation to some coin of the country wherein the purchase is made, or in relation to the standard value of the precious metals in such country, it is certain that the coin tendered will have a purchasing power only in exact relation to its intrinsic character.

Speculating in grain and other food stuffs, known technically as forestalling, engrossing, regrating, etc., has undoubtedly tended to create famines, and in England offenses of this character were prohibited by statute in 1552, but these laws were in their nature arbitrary, and could be tolerated only because they appeared to be made in the interest of the people. Such laws are contrary to all known principles of political economy. Adam Smith and his followers succeeded in proving that no rational argument could be given for upholding them, and were largely instrumental in their final repeal.

Misapplication of grain. Under this head is mainly to be noted the excessive use of grain in brewing and distilling, and by burning, whether willfully or by misadventure; also those wanton acts of waste, such as burning grain-stores, firing ricks, which have too often occurred during periods of scarcity.

Among the natural causes of famines are:

Rain. By excess of rain the soil becomes saturated, and seed decays. In hilly countries the seed is sometimes washed entirely out of the ground, and so is destroyed. This cause of famine is most frequent in tropical countries, where the rains often become torrents. Improved cultivation of the land, with good drainage, is the most effective remedy. Inundations from the sea, from rivers, from inland lakes, fall within this category, and have caused great mischief.

Frost. In temperate regions frost in several forms is destructive to vegetation. In the case of grain cultivation it may, by setting in early, prevent the efficient manipulation of the soil, and the sowing of the autumn seed. Or by being protracted beyond the early months of the year, it will prevent spring sowing, and even seriously injure the young crops. Combined with rain it will frequently destroy the vitality of the seed while yet in the ground. In France and other wine and olive producing countries, the damage occasioned by frost is immense. Such damage, as well as that occasioned by floods, is there a recognized danger against which insurance is purchased.

Drought. In all climates of a tropical character, drought is an important agent in preventing the development of vegetation. With moisture, solar heat develops luxuriant growth; without the moisture there is absolute sterility. The early Bible records refer to the rising of the waters of the Nile as the event upon which the fertility of Egypt depends. About 1060, the overflowing of this great river failed for seven successive years, occasioning one of the greatest famines of history. Two provinces were wholly depopulated, and in another, half the inhabitants perished. Even in temperate climates long-continued drought is very disastrous.

Earthquakes seem to have but little influence in producing famine, except in the immediate locality of their devastations. Where, however, they have produced irruptions of the sea or inland waters, which has not infrequently been the case, the damage has been extensive.

Hurricanes and storms frequently produce wide-spread injury. They also lead to irruptions of the sea, and to the overflowing of rivers; but as a rule these occur at periods of the year when grain and other crops are not sufficiently advanced to sustain serious damage by shaking or otherwise, or else when they have been harvested.

Hail-storms are usually local in their effects—rarely extending beyond 60 m. in their greatest length, and some 6 m. in width, and generally confined to much smaller limits. They are most prevalent and destructive to grain and fruit in the summer and autumn months. In France hail-storms are frequent and severe. The damage which they occasion has long been insured against in all parts of Europe.

Insects, vermin, etc. Insect plagues appear to have afflicted mankind from a very early period. Thus, flies and locusts were among the plagues of Egypt. The potato-growing regions of the United States and Canada have been seriously afflicted in the

last twenty years by the various species of insects known as potato-bugs. The recent famine in North China began in one district by a visitation of locusts. In India such visitations have occurred several times. England has suffered by plagues of insects, especially in 476, and again in 872. But few instances are recorded in which rats, mice, etc., destroyed crops to any serious extent. In 1581, there was a plague in Essex, England, and in 1812-13, a plague of rats in the Madras presidency, which in part occasioned the famine of that year.

FAMINES CELEBRATED IN HISTORY.

- B.C.
1708. Egypt; the famine of seven years began.
436. Rome; thousands threw themselves into the Tiber.
- A.D.
42. Egypt; awful famine.
262. Rome; attended by plague.
272. Britain; people ate the bark of trees.
306. Scotland; thousands died.
310. England; 40,000 perished.
370. Phrygia; awful famine.
450. Italy; parents ate their children.
739. England, Wales, and Scotland.
823. again; thousands starved.
954. again; lasted four years.
1016. Awful famine in all Europe.
1087. England, 21st year of William I.
1193. England and France, produced pestilential fever, until 1195.
1251. England.
1315. England; people ate horses, dogs, cats, and vermin.
1335. England; caused by long rain.
1353. England and France.
1438. England; bread was made from fern roots.
1565. Great Britain.
1693. France; awful famine.
1748. Great Britain; general throughout the realm.
1771. Bengal; devastated the country.
1775. Cape de Verde; 16,000 persons perished.
1789. France; grievously felt.
1795. England; severely felt.
1801. England; throughout the kingdom.
1813. Drontheim; when Sweden intercepted supplies.
1814, 1816, 1822, 1831, 1846. Ireland. The poor suffered greatly because of failure of the potato. In 1847, parliament voted \$50,000,000 to relieve the suffering of the people.
1837-8. North-western India; above 800,000 perished.
1860-1. North-western India; thousands perished.
1865-6. Bengal and Orissa; about 1,000,000 perished.
1868-9. Rajpootana, etc.; about 1,500,000 perished.
1871-2. Persia; very severe.
1874. Bengal; caused by drought.
1874-5. Asia Minor.
1877. Bombay, Madras, Mysore, etc.; about 500,000 perished.
1877-8. Northern China; very severe.
[Compiled from *Encyclopædia Britannica*, 9th ed.]

FANEUIL, PETER, 1700-43; b. N. Y., of French-Huguenot descent; became a merchant in Boston. He was the builder of Faneuil hall, the pride of old Boston, given to that city by him as a personal donation.

FANNIERE, FRANÇOIS AUGUSTE, and FRANÇOIS JOSEPH, b. the first in 1818, and the other in 1822; French engravers of especial eminence. Their masterpieces are two shields representing incidents from *Orlando Furioso*. Auguste is a member of the legion of honor.

FANNIN, a co. in n. Georgia, on the Tennessee and North Carolina borders; 425 sq. m.; pop. '70, 5,429—114 colored. It has a mountainous surface, and much of it is yet uncultivated. Co. seat Morgantown.

FANNIN, a co. in n.e. Texas on Red river, crossed by the Texas and Pacific railroad; 800 sq. m.; pop. '70, 13,207—2,484 colored. The surface is undulating, the soil fertile, and timber abundant. Co. seat, Bonham.

FANNIN, JAMES W., b. N. C., killed at Goliad, Texas, 1836. Being defeated by a superior force of Mexicans, Fannin and 356 others surrendered as prisoners of war, with the stipulation that they should be treated according to the ordinary rules. Instead of

carrying out the agreement Santa Anna ordered them to be shot, Fanning being the last victim.

FANNING, DAVID, 1756-1825; b. N. C. Having been robbed at the beginning of the revolution, by men who claimed to be whigs, Fanning became a tory, and committed many daring outrages, killing several men who had incurred his enmity. In one case he rushed into a village where a court was in session, and carried off the judge, lawyers, and spectators. Not long afterwards he captured Gov. Burke and his entire suite. When the patriots gained rule he fled to Florida, and from there to St. John, N. B. Here he was a member of the colonial assembly; but his character was developed in many villainies, culminating finally in sentence to death for rape; but he escaped from prison, and was afterwards pardoned.

FANNING, EDMUND, LL.D., 1737-1818; b. Long Island; a graduate of Yale. He was a tory in the revolution, and raised and commanded a regiment in the king's service. After the war he was rewarded with the offices of councilor and lieutenant-governor of Nova Scotia, and governor of Prince Edward's island. He rose to maj. gen. in the British army.

FANTEE, a section of the gold coast of Africa, lying along the gulf of Guinea, now under British protection. The country is well watered, fertile, and populous; the inhabitants belonging to the same family as the Ashantees, but more muscular, remarkably cleanly, and distinguished from other African tribes by small scarifications on the cheeks and back of the neck. They are separated from the Ashantees by a belt of almost untraversed forests, and declaring their independence, controlled about 100 m. of the coast. During a war with the Ashantees in 1807, they secured the aid of the English, but nevertheless were overrun by their enemies. They rebelled, with English help, in 1823, but were again subdued, and the British commander, sir Charles McCarthy, was captured and killed; but in 1823, the Ashantees were driven out of the Fantee territory, and until 1872 the Fantees were unmolested. In that year, the Ashantees complained of the treaty transferring the Dutch coast colonies to the English, and in 1873, the Ashantee king overran the Fantee country, and even threatened Cape Coast castle with a native force of 50,000. He was driven back, however, by sir Garnet Wolseley, in 1874.

FARAD, in electricity, a unit of quantity. See *Units of the Current Elements* in art, GALVANISM.

FARADIZATION. See **ELECTRICITY, MEDICAL**, *ante*.

FARALLONE ISLANDS, a group of small islands off the coast of California, the nearest one 32 m. w. of the entrance to San Francisco bay. They lie parallel with the coast, and their extreme points are about 12 m. apart. On the s. Farallone is an important light-house. These islands are the resort of myriads of sea-fowl, gulls, and murrees, whence eggs are carried, in great quantities, to the San Francisco market by a company which owns the islands.

FARTHAULT, a co. in s. Minnesota on the Iowa border, traversed by Mankato river, and the Southern Minnesota railroad; 720 sq.m.; pop. 75, 11,131. Surface undulating, and soil fertile, producing wheat, corn, butter, etc. Co. seat, Blue Earth City.

FARIBAULT, the seat of justice of Rice co., Minn., on Cannon river, and the Chicago, Milwaukee, and St. Paul railroad, 53 m. s. of St. Paul; pop. '75, 5,525. It has a fine court-house, a Roman Catholic academy, and convent, the Seabury divinity school, the Shattuck school, and a number of manufactories.

FARIDPUR, or **FURREEDPORE**, a district of British India in the Dacca division of Bengal, bounded n. and e. by the Ganges, w. by the Chandna and Madhumati, and s. by the Bikaganj; 1506 sq.m.; pop. '72, 1,012,589, of whom 588,299 were Mohammedans, and 420,988 Hindus. The district is flat in the s., but higher in the n., and a great portion is subject to inundation. The villages are built on artificially raised sites, or the higher banks of the streams. The climate is damp, the average annual rain-fall being 85½ in., and the mean temperature 77°. The chief rivers are the Ganges, the Arial Khar, and the Madhumati, which are navigable. Rice is the great crop; others are wheat, barley, oats, corn, oil-seeds, beans, sugar-cane, betel-leaf, date-palms, and indigo. More than half the cultivated surface is sown with rice. Three railroads intersect the district.

FARINELLI (real name **CARLO BROSCHI**), 1705-82; b. Naples; a remarkable soprano singer, whose voice was of unequalled compass, possessing seven or eight notes more than those of ordinary vocalists. His career was one of unbroken triumph. In Spain his voice was used by the queen to cure Philip V. of his melancholy mania, and he acquired such influence over the king as to be in power, if not in name, the real prime minister. Night after night he sang to Philip the same six songs, never varying the programme. Through his influence the Italian opera was established in Madrid.

FARLEY, MICHAEL, 1719-89; b. Mass.; a revolutionary leader; member of the general court; delegate to the provincial congress; member of the executive council, and delegate to the convention for framing the U. S. constitution.

FARMER, HUGH, 1714-87; an English theologian, a pupil of Dr. Doddridge. Among his works are *An Inquiry into the Nature and Design of our Lord's Temptation in the Wilderness*; *Dissertation on Miracles, designed to show that they are Arguments of a Divine Interposition, and Absolute Proofs of the Mission and Doctrine of a Prophet*; and *The General Prevalence of the Worship of Human Spirits in the Ancient Heathen Nations Asserted and Proved*.

FARMER, JOHN, 1789-1838; b. Mass.; especially devoted to genealogy. In 1829, he published a *Genealogical Register* which it was thought contained the names of nearly all the first European settlers in New England. A new edition with many additions was issued in 1862. He edited Belknap's *History of New Hampshire*, to which he added many valuable notes.

FARMINGTON, a village in a town and on a river of the same name in Hartford co., Conn., 31 m. n. of New Haven, on the New Haven and Northampton railroad; pop. of town, 2,616. It is an ancient, quiet, and beautiful village; with little business, but fine literary advantages. There are several churches, schools, and a seminary of the highest grade for girls. In the town there are some manufactories.

FARMINGTON, the seat of justice of Franklin co., Maine, on Sandy river, 73 m. n. of Bath, at the n. terminus of the Androscoggin division of the Maine Central railroad; pop. 3,251. It contains the court-house, the Western Maine normal school, Abbott family school, the Wendell institute for girls, and several manufactories. There are slate quarries in the vicinity.

FARNHAM, ELIZA WOODSON (maiden name BURHANS), 1815-64; b. N. Y.; married in Illinois to Thomas J. Farnham, the traveler. In 1841, she returned to New York, visited prisons, and lectured to the women convicts until 1844. She was four years matron of the Sing Sing state prison. In this period she published *Life in Prairie Land*, and edited Samson's *Criminal Jurisprudence*. In 1848, she was connected with the Boston institution for the blind. She was in California from 1849 to 1856, then returned to New York, and published *California, Indoors and Out*. *My Early Days* appeared in 1859, and in that year she organized a society to aid and protect destitute women in emigration to the west. *Woman and Her Era* was published in 1864.

FARNHAM, RALPH, 1756-1861; b. Me.; a soldier in the revolution, and the last survivor of the battle of Bunker hill. He was the first settler in Acton, Me. He lived 104 yrs. 5 ms. and 19 days. About a year before his death he was complimented by a grand concert in Tremont temple, Boston.

FARNHAM, THOMAS JEFFERSON, 1804-48; b. Vt. In 1839, he led a small expedition across the continent to Oregon. In California, the same year, he procured the release of a large number of American and English prisoners from the Mexican government. His *Travels in Oregon Territory* appeared in 1842; *Travels in California and Scenes on the Pacific*, in 1845; a *Memoir of the North-west Boundary Line*, and *Mexico, its Geography, People, and Institutions*, in 1848.

FAROCHON, JEAN BAPTISTE EUGÈNE, b. Paris, 1807; a medalist and sculptor, pupil of David. He studied in Italy as a pensioner of the academy, and on returning to France gained a good reputation for his medallions. He became professor in the school of the fine arts in Paris, 1863.

FARRAKILÁBÁD, or FURRUCKABAD, a district in the Agra division of the n.w. provinces of British India; a flat alluvial plain on the Ganges, which has a course through and along the district of 87 m.; 1744 sq.m.; pop. '72, 918,748; Hindus, 816,733; Mohammedans, 101,538; Christians, 477. Chief products, rice, wheat, barley, millet, pulse, cotton, sugar-cane, and potatoes. The chief town, on the Ganges, bears the same name.

FARRANT, RICHARD, a composer of English church-music in the 16th c., of whose life little is known. Among the most admired of his compositions are the anthems *Call to Remembrance* and *Hide not thy Face*. He is credited on insufficient proof with being the author also of *Lord, for thy Tender Mercies' Sake*.

FARRAR, ELIZA WARE, 1791-1870; a daughter of Benjamin Rotch of New Bedford, Mass.; b. Flanders (Europe); in 1828, married prof. John Farrar of Harvard college. She was the author of *Congo in Search of his Master*; *Children's Robinson Crusoe*; *The Story of Lafayette*; *The Life of Howard*; *Youth's Letter-Writer*; *Young Lady's Friend*; and *Recollections of Seventy Years*. Her later years were spent in Springfield, Mass.

FARRAR, FREDERIC WILLIAM, D.D., b. Bombay (India), 1831; graduate of Cambridge, Eng.; master of Marlborough college in 1871; and was made chaplain in ordinary to the queen. He has published *Erie*; *Julian Home*; and *St. Winifred's*. His philological works are *The Origin of Language*; *Chapters on Language*; *Greek Grammar Rules*; *Greek Syntax*; and *Families of Speech*. His theological works are *Seekers after God*; *The Silence and Voices of God*; *The Witness of History to Christ* (the Hulsean lectures for 1870 before the university of Cambridge); and *The Life of Christ*, which, among the many recent works on the same theme, is of great importance and interest as the matured production of one who has lovingly studied the Scripture testimony concerning Christ, aided by the lights of literature and discussion, as well as by his own sojourn in the land

where that life was lived; and who, with faith in the manifestation of Christ's divine work through nearly 19 centuries, seeks in the words and works recorded in the gospels the causes which awakened faith in Christ before the Christian history had been developed or the Christian name known. *The Life and Work of St. Paul*, from this author, is a companion work to the preceding. His *Eternal Hope*, a book not so much of argument as of glowing rhetoric, while not professing to invalidate the received doctrine of the church regarding the future of the ungodly, has met severe criticism as tending to reduce at least the stringency of the application of those doctrines.

FARRAR, JOHN, LL.D., 1779-1853; b. Mass.; graduated at Harvard in 1803, and studied theology at Andover; was Greek tutor at Harvard in 1805; in 1807, became Hollis professor of mathematics and natural philosophy. He published a translation of Lacroix's *Elements of Algebra*, and contributed many articles to scientific periodicals. In consequence of ill health he resigned his chair in 1836.

FARRAR, TIMOTHY, LL.D., 1747-1849; born Mass.; graduated at Harvard college, 1767. He settled in New Hampshire and taught school about 1770. He was a maj. in the American army in the revolution, was a justice of the common pleas for 40 years. In 1843, he was appointed chief-justice of New Hampshire. He was also a member of the new Hampshire constitutional convention, and one of the committee which drafted the constitution.

FARREN, ELIZA, Countess of Derby, 1759-1829; an English actress, playing with great success in the London theaters in the latter part of the last century. In 1797, she married the 12th earl of Derby, a widower.

FARRER, HENRY, b. London, England, 1843; an artist in water colors, residing in New York; brother of Thomas Charles Farrer.

FARRER, THOMAS CHARLES, b. London, 1838; an English artist; studied drawing in Ruskin's free school, and in 1858 came to the United States. In the war of the rebellion he served in the union ranks as a private. Soon after the war he returned to England, where he still resides.

FARRIERY. See FARRIER and HORSESHOEING, *ante*.

FATHIPUR, or FUTTEHPUR, a district in the Allahabad division of the n.w. provinces of British India, in the s.e. corner of the tract between the Ganges and the Jumna: 1586 sq.m., pop. '72, 663,877, of whom 593,256 were Hindus, 70,554 Mohammedans, and 5 Christians. The district is an alluvial plain formed by the deposits of the two rivers. There are two harvests in a year, the autumn crop consisting principally of rice, and the spring crop of wheat, barley, etc. The East India railway runs through the district.

FATTY DEGENERATION, a pathological term signifying the gradual replacement by fat-globules of the tissues of a living body, impairing and finally destroying them. These globules, though originating in the living tissues and existing among them, have in themselves no element of life; hence when they replace living tissues they are destructive of them. Fatty degeneration must be distinguished from obesity, which is simply excessive deposition of fat between the tissues. The disease, which is not regarded as curable, is of frequent occurrence, and it attacks nearly all the tissues, particularly the muscular and cellular, as in the heart and liver, which organs are often the seats of the disease. The red blood globules and the nerves are probably never attacked by it.

FAULK, a new co. in central Dakota, 1000 sq.m.; organized since the census of 1870. It is mainly a table-land, drained by a branch of the Dakota river.

FAULKNER, a co. in n. Arkansas, on the Arkansas river, reached by the Little Rock and Fort Smith railroad; 650 sq.m.; formed since the census of 1870. Co. seat, Conway.

FAULKNER'S ISLAND, in Long island sound; off the harbor of Guilford, Conn. It belongs to New York, and has a light-house and a fog-bell.

FAUQUIER, a co. in n.e. Virginia, between the Rappahannock and the Blue Ridge, intersected by the Virginia Midland and Great Southern railroad, and by the Manassas branch of that railroad; 680 sq.m.; pop. '70, 19,690—7,856 colored. Surface undulating, and to a large extent covered with forests. Productions, corn, wheat, oats, pork, etc. Co. seat, Warrenton.

FAUQUIER, FRANCIS, d. 1768; for 10 years lieutenant-governor of Virginia. He was the successor of gov. Dinwiddie, and his administration was popular and prosperous. He published in London in 1757 *Raising Money for the Support of the War*.

FAURE, JEAN BAPTISTE, b. 1830; a French vocalist, educated at the conservatoire, and made his first public appearance in 1852. In 1857, he was made professor of singing in the conservatoire. He has often appeared in opera in London.

FAUVEAU, FÉLICIE DE, b. Florence, 1803; a French sculptor of an old legitimist family in Brittany. She was compromised in the royalist movement of 1832, but escaped to Brussels. Among her works are "The Abbot" (from Scott's novel); "Judith showing

the Head of Holophernes to the People;" the Dante monument, representing the death of Paolo Malatesta and Francesca da Rimini; and the tomb of a young Florentine girl.

FAUVELET, JEAN BAPTISTE, b. France, 1822; a painter, disciple of Meissonnier. Among his pictures are: "A Young Man Reading," "The Two Roses," "The Concert," "Nonchalance," "The Carver," "Two Musicians," and "The Prodigal Son."

FAVONIA, a genus of jelly-fishes of the order *discophora*. One species has a hemispherical body, with a long proboscis and eight branch-like appendages.

FAVORINUS, a sophist of the time of Hadrian, a native of Arles, in Gaul, but for many years a traveler in the east. He was on intimate terms with Plutarch, Herodes Atticus, Demetrius of Alexandria, Aulus Gellius, and with the emperor Hadrian himself. He seems to have been caustic and satirical, but politic; for when he allowed the emperor to carry off the honors of an argument in which he might easily have won, he merely remarked that it was foolish to dispute with one who was master of thirty legions. Only a few fragments of his works have been preserved.

FAVULARIA, a sub-genus of *sigillaria*, including some of the most remarkable trees of the coal flora. See *SIGILLARIA*.

FAWCETT, HENRY, b. England, 1833; educated at Trinity hall, Cambridge, of which he was a scholar; graduated with high mathematical honors in 1856, and was elected a fellow in the same year. Mr. Fawcett was totally deprived of his sight in 1858 by an accident when shooting. Having written and published *A Manual of Political Economy; the Economical Position of the British Laborer*; and having been an extensive contributor of articles on economic and political science to various magazines and reviews, he was elected, in 1863, professor of political economy in the university of Cambridge. He unsuccessfully contested for a parliamentary seat, on liberal principles, Southwark in 1857; the borough of Cambridge in 1862; and Brighton in Feb., 1864; but he was returned for the last-named constituency in 1865, and was re-elected in 1868. He was unseated at Brighton at the general election of Feb., 1874, and was elected for Hackney in April of the same year. A new and revised edition of his *Manual of Political Economy* was published in 1869, with two new chapters on "National Education," and "The Poor Laws and their Influence on Pauperism;" and another edition with some additional chapters was published in 1874. He has since published *Pauperism—Its Causes and Remedies; Speeches on some Current Political Questions; and Free Trade and Protection*. Prof. F. married Millicent, daughter of Newson Garrett, of Aldeburgh, Suffolk, April 23, 1867. Mrs. Fawcett, who was born in 1847, published, in 1869, *Political Economy for Beginners*; in 1872, Mr. and Mrs. Fawcett published a joint volume of essays and lectures on political and economical subjects; in 1874, Mrs. Fawcett took an active part in advocating the extension of the parliamentary suffrage to those women who fulfill the qualifications of property and residence demanded of electors.

FAY, JONAS, 1737-1818; b. Mass.; a surgeon under Ethan Allen at the surrender of Ticonderoga; a member of the convention that declared Vermont an independent state; secretary of the state constitutional convention; one of the council of safety; member of the state council; judge of the supreme court; and agent of the state before congress, Jan., 1777; Oct., 1779; June, 1781; and Feb., 1782.

FAY, THEODORE SEDGWICK; b. N. Y., 1807; studied law, and was admitted to practice in 1828, but contributed to the *New York Mirror*, and subsequently became editor of that periodical. In 1832, he published *Dreams and Reveries of a Quiet Man*. After three years of European travel, he published his journal under the title, *The Minute Book*. In 1835, he published *Norman Leslie*, a novel, of which a second edition was issued the same year. From 1837 to 1853 he was U. S. secretary of legation at Berlin; and, 1853-61, resident minister at Berne, Switzerland. He has also published *Sidney Clifton; The Countess Ida; Hoboken; Robert Rueful; Ulric, or the Voices*, a poem; *Views of Christianity; Great Outlines of Geography; First Steps of Geography; a History of Switzerland*; and a series of papers on Shakespeare.

FAYE'S COMET, discovered Nov. 22, 1843, in the constellation Orion; a bright nucleus with a short tail, but never sufficiently developed to be seen with the naked eye. Le Verrier showed that this comet came into our system as far back as 1747. It was rediscovered Nov. 28, 1850, by Chellis of Cambridge, and it came to perihelion Sept. 12, 1853. It was also seen in 1869. Its period is supposed to be nearly 7½ years, but it is too small to be of much interest. Its discoverer, Herve Auguste Etienne Albans Faye, a French astronomer, was born in 1814. He became a member of the French institute, and was elected to the section of astronomy in 1841, and the bureau of longitudes in 1862. Two years later he entered the imperial council of public instruction, and was made an officer of the legion of honor. From 1848 to 1854, he was professor of geodesy in the *Ecole Polytechnique*, and in 1854 was chosen rector of the *Académie Universitaire* at Nancy. He has written valuable papers and text-books on astronomical science.

FAYETTE, a co. in n.w. Alabama; 684 sq. m.; pop. '70, 7,136—1077 colored. It is drained by the Sipsey and affluents of the Black Warrior rivers. Surface hilly and

chiefly forest-land. Productions, cotton, corn, pork, etc. Co. seat, Fayette Court-house.

FAYETTE, a co. in w. Georgia, on Flint river; 240 sq.m.; pop. '80, 8,605—2,864 colored. It has a varied surface, undulating or level, and is largely covered with timber. Cotton and corn are the chief productions. There are beds of iron ore and deposits of valuable granite. Co. seat, Fayetteville.

FAYETTE, a co. in s. central Illinois, on the Kaskaskia river, and the Illinois Central, and the St. Louis, Vandalia, and Terre Haute railroads; 786 sq.m.; pop. '80, 23,243. The surface is level, and much of it is covered with timber; soil fertile, producing corn, wheat, oats, hay, pork, etc. Coal and limestone are among the minerals. Co. seat, Vandalia.

FAYETTE, a co. in s.e. Indiana, on a branch of Whitewater river; traversed by the Whitewater canal, and the Cincinnati and Indianapolis Junction, and the White-water Valley railroads; 200 sq.m.; pop. '70, 10,476. Undulating surface and fertile soil, with considerable timber. The usual cereals are produced, and there is abundance of limestone. Co. seat, Connorsville.

FAYETTE, a co. in n.e. Iowa, on the Burlington, Cedar Rapids, and Northern, and the Davenport and St. Paul railroads; drained by Turkey and Volga rivers; 720 sq.m.; pop. '80, 22,258. It has a prairie and forest surface, and produces wheat, corn, oats, hay, etc. Good limestone is found. Co. seat, West Union.

FAYETTE, a co. in n. central Kentucky, on the Kentucky river, intersected by the Cincinnati Southern, the Louisville, Cincinnati, and Lexington, and the Kentucky Central railroads; 320 sq.m.; pop. '70, 26,656—12,513 colored. The surface is varied, and offers some delightful scenery. The soil is very fertile, producing wheat, oats, corn, cattle, etc. Co. seat, Lexington.

FAYETTE, a co. in s.w. Ohio, crossed by the Dayton and Southwestern, and the Cincinnati and Muskingum Valley railroads; 414 sq.m.; pop. '80, 20,364. The surface is nearly level, and the soil deep and fertile, producing corn, wheat, cattle, pork, etc. Co. seat, Washington.

FAYETTE, a co. in s.w. Pennsylvania, on the border of West Virginia, intersected by the Youghiogheny river, and bounded by the Monongahela river; crossed by the Pittsburg, Washington, and Baltimore railroad; 800 sq.m.; pop. '70, 43,284. The surface is hilly, and largely covered with forests; soil fertile; chief productions, wheat, corn, oats, wool, pork, and butter. Co. seat, Uniontown.

FAYETTE, a co. in s.w. Tennessee, on the Mississippi border, crossed by the Nashville and Mississippi, and the Charlestown railroads; 676 sq.m.; pop. '70, 26,145—16,987 colored. Surface nearly level, with much forest-land. Products, wheat, corn, cotton, sweet potatoes, etc. Co. seat, Somerville.

FAYETTE, a co. in s.e. Texas, on the Colorado river, reached by the Galveston, Harrisburg, and San Antonio railroad; 1025 sq.m.; pop. '70, 16,863—5,901 colored. Surface undulating, and soil fertile; productions, cotton, corn, cattle, etc. Co. seat, La Grange.

FAYETTE, a co. in central West Virginia, bisected by the Kanawha river and the Chesapeake and Ohio railroad; 770 sq.m.; pop. '70, 6,647—118 colored. Surface rough, with fine mountain scenery; soil fertile, and adapted to cattle raising. Co. seat, Fayetteville.

FAZY, JEAN JAMES, 1796-1878; a Swiss statesman, educated in France, and connected with Parisian journalism. Returning to Switzerland in 1832, he was active in the establishment of a new constitution, and of the introduction of trial by jury. In 1846, he was at the head of a provincial government of radicals in Geneva, and subsequently a conspicuous advocate of the new constitution. In 1853, he was vice-president of the federal council of states. He was again at the head of the Geneva government in 1855. In 1864, he was compelled to resign, and being indicted for complicity in the riots of that year, he fled to France, but subsequently returned, and occupied a seat in the grand council, which he resigned in 1865, but resumed again in 1868.

FEATHERFOIL, or WATER VIOLET, the *Hottonia inflata* of the United States, and *Hottonia palustris* of Europe, named from Peter Hotton, a Dutch botanist. It is a primulaceous plant, which grows submerged in water, but bears its blossoms, in the European species of great beauty, on long scapes sent up into the air.

FEATHER STAR, *Comatula rosacea*. An interesting member of the class of echinoderms, order of erinoids. It has a pentagonal disk or body composed of numerous polygonal plates from which spring ten slender, flexible, feathery arms, formed of numerous calcareous pieces placed end to end, but admitting of free motion. The arms are for locomotion and not prehension. The mouth is central and the alimentary canal is entirely contained in the disk or body, no part of it sending branches into the arms, as in asteroids. The feather star feeds upon minute organisms, which it draws into its stomach by the action of cilia in the alimentary canal. When young the animal is attached to a stalk, and has been mistaken and described as a distinct species under the

name of *pentacrinus Europæus*. In attaining the adult state the animal becomes free. The genus *comatula* has a wide distribution, inhabiting most seas.

FEATHER-STONE, meaning, doubtless, *federal stone*, a stone table in the open air at which the ancient courts-baron were held, and where covenants were made.

FEBIGER, CHRISTIAN, 1747-96; a revolutionary soldier, a native of Denmark. He was taken prisoner in Arnold's attack on Quebec, served honorably at Bunker Hill, Stony Point, and Yorktown, at the latter place commanding a Virginia regiment. In his later years he was treasurer of the state of Pennsylvania.

FECHNER, GUSTAV THEODOR, a German savant, b. 1801. After a course of study at Sorau and Dresden he studied medicine at Leipsic, where he became professor of physics. He has written largely upon chemistry, physics, anthropology, medical science, philosophy, and antiquities, besides poetry, criticism, and humorous literature. Among his more important works are *Nanna, oder über das Seelenleben der Pflanzen*; *Elemente der Psychophysik*; and *Physikalische und Philosophische Atomlehre*.

FECHTER, CHARLES ALBERT (*ante*), 1824-79; b. London. His father was of German and his mother of Italian descent. He was educated in France, and in 1840, appeared in private theatricals; in 1841, was with a strolling company playing at Florence, returning to Paris the same year and studying at the *conservatoire* with a view of entering the theater Française. For three years he studied sculpture, but gave it up for the stage, and in 1844 made his *début* in Paris as "Seyd" in Voltaire's *Mahomet*. Afterwards he played in Berlin, and in 1847 took a French company to London. From 1848 to 1860, he was the reigning favorite in Paris. He was the original "Armand Duval" in *Les Dames aux Camélias*, in which part he won remarkable success. In 1860, he made his first appearance in English drama in London in *Ruy Blas*, following with *Corsican Brothers*, *Don Cesar de Bazan*, *Hamlet*, *Othello*, *Bel Demonio*, *Belphegor*, *Master of Ravenswood*, and as "Oberreizer" in *No Thoroughfare*. In 1870, he appeared in New York in most of these characters. He undertook to manage a theater in Boston, but did not succeed. In 1874, he appeared again in New York with Lizzy Price (who became his wife). Not long afterwards he retired to a farm in Pennsylvania, where he died.

FECKENHAM, or FECKNAM, JOHN DE, d. 1585; the last abbot of Westminster, and the last mitred abbot who sat in queen Elizabeth's parliament. He was chaplain to Bonner, bishop of London; and when the latter was deprived of his see, Feckenham was sent to the Tower. Although for much of the time a prisoner, he was active in political matters. Queen Mary released him and made him her chaplain. He was sent to lady Jane Gray, two days before her execution, to commune with her, and "to reduce her," says Foxe, "from the doctrine of Christ to queen Mary's religion." It is said that Elizabeth offered him the archbishopric of Canterbury; but that he refused it because he could not conform to the new (Protestant) faith. All his influence was thrown against the reformation and its doctrines.

FECDUNATION (*ante*). One of the most interesting subjects of philosophical inquiry is that of insect fertilization of plants. Naturalists have long been aware of the fact that pistillate flowers, whether growing on the same trees with the staminate, or on different trees (monœcious or diœcious), owe their fertilization to the agency of insects, which carry the pollen from the staminate to the pistillate flowers. Nearly all such plants have flowers which secrete a nectar attractive to insects, and this has been regarded as one of the numerous evidences of the agency of a designing providence; but still stronger evidence, if possible, is furnished by the fertilization of *perfect* flowers by insects. It has generally been thought that flowers bearing both stamens and pistils were always self-fertilizing, but this is not the case with many kinds. There is a provision by which several plants are prevented from in-and-in breeding, the parts of the flower being so arranged that it is impossible for the pollen to come in contact with the stigma. This is the case, among others, with the numerous family of *orchids*; and one of the most interesting works upon the subject was written by the advocate of the *Origin of Species by Natural Selection*, in which there is conclusive evidence that provision has been made, not only with the evident design of preventing self-fertilization, but also with the design of attracting the insect, which is made the agent of the fecundating act. (See *Fertilization of Orchids*, by Charles Darwin, London, 1862.) For the purpose of more perfectly insuring cross fertilization, in some flowers the stamens precede the female organ in development, and shed their pollen before impregnation can take place, leaving the fertilization to be accomplished by the agency of insects, which carry the pollen from other flowers not so forward in development.

FEDERAL GOVERNMENT (*ante*), a body-politic composed of the people of several different and in some respects independent states, over which, in its own prescribed sphere, it exerts a supreme authority; while outside of that sphere the states and the people thereof are sovereign within their respective jurisdictions. The character of a federal government varies with the extent of its powers. The first form of "federal government" established in this country was that of the "Articles of Confederation," adopted during the war of the revolution, July 9, 1778. The separate colonies, finding some form of central government indispensable to the efficient prosecution of the war

of independence, gave a reluctant consent to those articles, which, while the war lasted, and all felt the presence of a common danger, worked tolerably, though not without some embarrassing friction arising from notions of colonial or state sovereignty. But after the independence of the country was established, and the pressure of a common danger no longer existed, there was a disposition to exalt the state, and to depreciate the national authority, which to some extent was regarded as a burden. The national government had no judicial tribunal to make an authoritative exposition of its powers, and no executive officers to enforce its decrees; it was entirely dependent upon the voluntary action of the states for means to carry on its operations; so that, in the language of Washington, it was "little more than a shadow without the substance," and "congress a nugatory body, their ordinances being little attended to." There was, in short, an utter want of all coercive authority on the part of the government to carry into effect its own constitutional measures. The embarrassments growing out of this state of things were endured till 1787, when a convention of delegates from the several states was held in Philadelphia "for the purpose of revising the articles of confederation and reporting to congress and the several legislatures such alterations and provisions therein as shall, when agreed to in congress and confirmed by the states, render the federal constitution adequate to the exigencies of the government and the preservation of the union." The convention encountered many difficulties arising from diversities of opinion among its members, and from conflicting local interests, but finally succeeded in framing a constitution which the people of the several states finally ratified, and which, with various amendments, has continued to this day. From the time of its adoption different theories of interpretation have prevailed, and these conflicting theories, to a greater or less extent, have determined the character and aims of political parties. It has been contended on the one side that the union was merely a league between the several states in their organized capacity, and that each state had the right, at its pleasure, of withdrawing therefrom. On the other side it has been held that the union, instead of being the creation of the states, as such, was formed by "the people of the United States," acting indeed through their respective state organizations, but still as citizens of a common nationality. According to this theory no right of secession on the part of a state has any existence, but it is the right and the duty of the national government to maintain the union by force. This question was brought to an issue in the late rebellion, the slaveholding states seeking to exercise the assumed right of secession for the protection of slavery, and the non-slaveholding states taking up arms for the defense of the union. The results of the war are generally regarded as a vindication of the anti-secession theory, though there are still some disputed questions as to the relative powers of the national and state governments.

Another example of federal government is afforded in the Dominion of Canada, founded in 1867 by a union of the provinces of Canada West, Canada East, New Brunswick, and Nova Scotia, and afterwards enlarged by the addition of the provinces of Manitoba and British Columbia, the British territory, and Prince Edward Island. These provinces have each its local legislature, while the government of the Dominion, essentially like that of the American union, extends over the whole territory. The government of the Dominion is administered by a governor-general appointed by and representing the British crown and exercising his authority with the aid of a council appointed by himself. The parliament consists of a senate of not more than 72 members, appointed for life by the governor-general; and a house of commons of 180 members, chosen by and representing the people of the several provinces. The different cantons of Switzerland are united under a common government in a similar way.

FEDERALIST. THE, a collection of essays in favor of the new constitution of the United States, with the exception of the concluding nine of the eighty-six numbers, originally published in *The Independent Journal*, a semi-weekly newspaper printed in New York, between the 27th of Oct., 1787, and the 2d of April, 1788. The authors were Alexander Hamilton, James Madison, and John Jay, who addressed themselves over the common signature of "Publius" in a series of letters "To the People of the State of New York," with the avowed purpose of securing the accession of that state to the constitution as proposed by the federal convention of Sept. 17, 1787. The essays have often been republished in a volume.

FEDERALISTS, the earliest political party organized in the United States after the achievement of liberty. The leaders were Washington, Adams, Hamilton, Jay, Marshall, and others of their rank and ability. In the French revolution, the federalists sympathized rather with England than with the party of Marat and Robespierre; and this gave occasion to Jefferson, who was ambitious to be president, to organize, in connection with Burr and others, a party called "republican," whose distinctive features were to intensify the natural feeling against England, and to accuse the federalists of being enemies of the masses of the people, of favoring an aristocratic government, and even of designs against the newly achieved liberties of the nation. The federalists had their own way in the elections for the first three terms, electing Washington twice and John Adams once; but in the canvass of 1796, Jefferson and Burr were the republican candidates. At that time, no discrimination was made by the electoral college between president and vice-president, each elector voted for two persons, the man having the highest vote took the

first office, and the other went to the next highest. The vote was: Adams, 71; Jefferson, 68; Pinckney (fed.), 59; Burr (rep.), 30; with 46 votes scattered among nine others. Thus, we had a federalist for the first and a republican for the second officer. In 1800, Adams was again a candidate, with C. C. Pinckney (fed.), and Jefferson and Burr (rep.) opposed. The electoral vote showed for Jefferson, 73; Burr, 73; Adams, 65; Pinckney, 64. There being an equal vote between Jefferson and Burr, the house of representatives was compelled to elect, and the vote was taken by states. After 36 ballots, Jefferson got 10, and Burr 4 states, and two states voted blank. So Jefferson took the first office. In subsequent elections, the federalist candidates for president were Charles C. Pinckney in 1804 and 1808, De Witt Clinton in 1812, and Rufus King in 1816. Clinton had the largest electoral vote, 89 to 128 for Madison. In the struggle with England, the federalists were charged with hostility to the war; and with some show of reason. The capitalists and merchants of the country were chiefly of that party, and capital always dreads the disturbance of war. Although weak in votes they were strong in social and political position and influence, and were a constant source of fear to the more popular republicans. In 1814, the federalists committed suicide as a party by holding the famous Hartford convention, the motives and actions of which were construed, though unjustly, yet not unnaturally, to be directly opposed to the war, and little short of treasonable. In fact, the convention was opposed not to the war, but to the manner in which it was conducted, and to acts of the administration which they deemed oppressive and unjust to the New England states. See HARTFORD CONVENTION. The unmeasured denunciation of this convention overwhelmed what there was left of the old federal party, and it speedily passed out of consideration as a national organization. In the succeeding presidential election (1816), Rufus King got but 34 out of 221 electoral votes, and only three (Massachusetts, Connecticut, and Delaware) of the 19 states. The last appearance of a federalist candidate for president was in 1820, and he received but one electoral vote (from New Hampshire) out of a total of 235.

FEDERAL THEOLOGY is the result of efforts to compress the doctrines of Christianity within the bounds of certain covenants conceived of as made between God and men. The essential idea of an ordinary covenant—that of a mutual compact between two parties by which each engages to render some benefit to the other—is indeed shut out by the nature of the case. When God and men are the parties, the benefit distinctively comes from him and the obligation distinctively rests on them. If the relationship exist between them, it must be determined and imposed by his sovereign right as a ruler. Yet it is more than a law or a promise. It includes a law to be obeyed, but the benefits far transcend the merit of the obedience. Mutual consent and obligation also are, in some sense, implied, as, on the one hand, God graciously binds himself to fulfill certain promises, and, on the other, men consent to the arrangement when, understanding the conditions prescribed, they enter on a course of obedience. Those who find advantage in adopting this method of expressing Scripture truth, generally speak of two covenants, the one of works, the other of grace. In both they see the same contracting parties—God and man; the same blessing to be secured—eternal life; and the same requirement of perfect obedience: but in the covenant of grace there is a dispensation of mercy, through the divine Mediator, which secures eternal life. I. The covenant of works, though nowhere in Scripture spoken of under that name, is thought to be referred to or implied. Some, indeed, think that it is expressly mentioned in Hosea vi. 7, which they translate, "They, like *Adam*, have transgressed the covenant." The contrast and analogy which Paul traces between the first and second Adam would (they say) have no basis unless a covenant had been entered into with the one as well as the other. Several essential features of a covenant are (they think) to be seen in the constitution under which Adam was placed: 1. Eternal life was promised him on condition of his obedience; 2. He was constituted the representative of his race; 3. His powers were sufficient for the performance of the condition; 4. He would have secured eternal life for his descendants, as well as for himself, had he continued faithful; 5. The penalty of disobedience was death, natural, spiritual, and eternal, as each of these followed a forfeiture of a divine life. After a time (how long is not known) this covenant was broken on the part of man who, "being left to the freedom of his own will, fell from the estate in which he was created." II. The covenant of grace is the name given, according to the view of these theologians, to God's glorious appointment of salvation by grace. We may conceive of the race as fallen, and of a merciful provision being made by which a door is opened wide enough for all mankind to enter, with a system of means by which the actual salvation of a limited number will be secured. Or we may regard the eye of God as fixed first on a limited number of the fallen race, and for their sake alone providing an atonement, sufficient indeed for all men, but designed and efficient for the salvation only of that limited number. The latter is the aspect in which the covenant of grace is presented by some at least of its advocates. They suppose that God from eternity, anticipating the temporary character of the covenant of works, ordained another plan by which a portion of mankind would be saved from the ruins of the fall. Why he did not include the whole or a larger portion of mankind within the scope of his saving grace they prefer to leave where, they think, revelation leaves it—to the mere good pleasure of God. And, as the Bible speaks of some who were chosen in Christ

before the foundation of the world, they infer that there must have been in eternity an agreement between the persons of the sacred Trinity, according to which a seed was given to the Son to serve him. Without ascribing to the transaction the technicalities of a human compact, they contend that something equivalent to it must have existed. And as men could not act for themselves, the Son of God acted for all those of whom he was to be the spiritual head. To constitute a natural ground for this headship, he was to become Man, uniting his divinity in one person with humanity. He would thus become the federal head of his spiritual seed (as Adam was of his natural descendants), and as such, acting as their representative, the Son would share with them the curse which the first sin brought on the human race, suffering even unto death in its most terrific form. Though these sufferings would not be the same as the doom which otherwise would have come on them spiritually and eternally, they are supposed to be of infinite value on account of his infinite dignity. They are indeed sufficient in objective worth to make expiation for any amount of sin in any number of worlds. They do actually confer innumerable benefits on all men. Through them pardon and salvation are offered to every one who hears the gospel: time, opportunity, and means of grace are afforded to all. But, it is agreed, all are not made partakers of salvation, and only a portion of mankind were eternally given to Christ. Plainly the success of his work was not left uncertain. A seed was secured to him by covenant; and it was with ultimate and supreme reference to these that he entered on his work. Such, it is declared, was the covenant of grace as formed in eternity. To this is to be added its accomplishment in time. The administrator of it is the Son of God himself, the mediator between God and man. He has power over all flesh, that he may give eternal life to as many as have been given him. He represented the divine ruler in all the merciful dispensations of which sacred history informs us. Although at different periods the outward forms of religion have been changed, the covenant of grace, which is the foundation of all, has always been the same. Believers before the flood, the patriarchs, Job and his friends, the Israelites under the Mosaic dispensation, looked for forgiveness under certain prescribed conditions, and for a city beyond the present world, whose builder and maker is God. All national restriction removed, and the Holy Ghost in his fullness given, the Christian dispensation is the ultimate form in which the covenant of grace will be administered. The Lord Jesus Christ will continue to be its head until the whole world is subdued unto him. Finally, the present economy of things will cease, the dead will be raised, the living changed, all men judged at Christ's bar, and sentence passed on them according to their works. Then having obtained full possession of his kingdom, the Son will deliver it to the Father, either as indicating the close of his mediatorial office, or perhaps only in token of the completeness and loyalty of his work. It may be noted here that there is a form of theology which, recognizing the great facts of salvation by God's eternal grace, and not denying that they may be made to appear under terms of various covenants, deems it more natural and scriptural to set them forth under the terms of sovereign divine constitutions or ordinances.

FEHMIC COURTS, or **VEHMGERICHTE**. See **FEHMGERICHTE**, *ante*.

FEKE, ROBERT, one of the earliest of American artists, his portraits dating back to about 1746. He settled in Newport, R. I., but visited Philadelphia, New York, and other cities professionally. It is said that when young he was made a captive and taken to Spain, where he employed himself in making sketches, from the proceeds of which he was enabled to return home.

FELDKIRCH, the chief t. in the Voralberg district, Tyrolean Austria, at the junction of the valleys of the Rhine and the Ill, 6½ m. above the confluence of the two rivers; pop. '69, 2,868. It is a place of considerable trade, and has manufactures of cotton, metals, etc. It is the seat of a bishop, and has a Jesuit seminary and a Capuchin monastery. Near the place are the ruins of the castle of Schattenburg, where the counts of Montfort had their seat.

FELICE, FORTUNATO BARTOLOMEO DE, 1725-89; an Italian author; studied in Rome and Naples under Jesuit teachers. Having abducted a nun from a convent he fled to Switzerland, settled at Berne, and became a Protestant. He subsequently founded a school and a printing-office at Yverdon, where he published a literary periodical and some political works. His chief work was an *Encyclopedua* in 48 quarto vols. with 10 vols of illustrations, in which he was assisted by Euler and others.

FELICITAS, SAINT, a Christian martyr who with her seven sons suffered death in the 2d century. All were arraigned together, and all refused to renounce Christianity. The mother was beheaded, and the sons were killed in various manners. Another St. Felicitas suffered death with St. Perpetua under Caracalla about the beginning of the 3d century.

FELIX, CELESTIN JOSEPH, a French preacher, b. 1810; studied at Cambrai, and entered the Jesuit novitiate in 1837. He completed his theological studies at Brugellette, Louvain, and Laval, and was appointed professor of rhetoric at Brugellette. In 1851, he preached the advent sermons in the church of St. Thomas d'Aquin, in Paris, and the next year the Lenten lectures in the church of St. Germain de Prés. In 1853, he succeeded Lacordaire and Ravignan in the pulpit of Notre Dame, which he occu-

ped till 1839. He became the superior of his order in Nancy, and in 1871 superior of the Jesuit residence in the rue de Sèvres, Paris. Many of his sermons have been published.

FELIX, MARCUS MINUCIUS, a Roman lawyer and Christian, author of *Octavius*, a dialogue in defense of Christianity. He lived in the early part of the 3d century.

FELLATAHS, or FOULAHs, a people of Africa occupying the valley of the Niger between Timbuctoo and Dahomey. About the middle of the last century they became converts to Mohammedanism, and, abandoning their nomadic life, formed independent states and conquered some of the neighboring peoples. At present the region under their control is estimated at 300,000 sq.m., and their numbers at 6,000,000. Their color, as a rule, is black, intermixed with a striking copper hue, some of them being hardly more dark than gypsies; and their hair is much less woolly than that of negroes. They live in clean habitations and are industrious. Children of both sexes are taught to read and write. The men wear swords at all times. The Fellatahs are almost constantly at war with the Arabs.

FELLER, FRANÇOIS XAVIER DE, 1735-1802; a Belgian Jesuit, educated at Rheims; professor of physical science at Luxemburg and Liege. In 1764, he was professor of theology at Tyrnau, Hungary; but in 1771, he returned to his professorship at Liege, remaining until the suppression of the Jesuits in 1773. He published *Catechism of Philosophy*; *Historical and Literary Dictionary*; *Course of Christian Morals and Religious Literature*; and *View of the Congress of Ems*.

FELLOW-COMMONER, a wealthy or married under-graduate of Cambridge, Eng., who pays extra to dine at the "commons" or fellows' table. At Oxford, they are called gentleman commoners.

FELLOWES, ROBERT, 1770-1847; b. England; graduated at Oxford; took holy orders in 1795; but soon afterwards left the established church, with whose doctrines he differed. His own views he gave in *Religion of the Universe*, 1836. Before this he had published *A Picture of Christian Philosophy*; *Religion without Cant*; *The Guide to Immortality*; *Manual of Piety adapted to the Wants and Calculated for the Improvement of all Sects of Christians*; and *Body of Theology*. He was a liberal benefactor of the university of London.

FELLOWS, JOHN, 1733-1808; b. Conn. He served in the French war, and was a member of the provincial congress in 1775. After the conflict at Lexington, he led a regiment to Boston, and subsequently commanded a brigade in the battle of Long island, and was in the engagements at White Plains and Bemis Heights. His highest rank was brigadier-general.

FELSING, JAKOB, b. 1802; a German engraver, a pupil of his father and of the Milan academy. He was noted for the accuracy with which he reproduced the peculiar characteristics of paintings which he engraved, some of which were Correggio's "Marriage of St. Catherine," Carlo Dolci's "Christ on the Mount of Olives," Raphael's "Violin Player," and Overbeck's "Holy Family."

FELSPAR. See FELDSPAR, *ante*.

FELTON, CORNELIUS CONWAY, LL.D., 1807-62; b. Mass.; graduated at Harvard, 1827; and taught in Northampton, Mass., and at Geneseo, N. Y. In 1829, he was Latin tutor at Harvard; in 1830, Greek tutor; in 1834, he became Eliot professor of Greek; and in July, 1860, was inaugurated president. Among his publications were *Homer, with English Notes and Fawcett's Illustrations*; *Monzel's German Literature*; *Clouds of Aristophanes*; *Ancient Literature and Art*; *Poets and Poetry of Europe*; *Panegyricus of Isocrates*; *The Agamemnon of Æschylus*; and *Guyot's Earth and Man*. In 1853-54, he made a European tour; in 1855, he revised for publication Smith's *History of Greece*, with an edition of lord Carlisle's *Diary in Turkish and Greek Waters*. A selection from modern Greek writers was published by him. Other works of his were *Life of Gen. Eaton* in Spark's *American Biography*; addresses; and contributions to the *North American Review*. He was a member of the Massachusetts board of education, regent of the Smithsonian institution, and a member of the American academy of arts and sciences.

FELTRE, MORTO DA, an Italian painter who lived about the close of the 15th and opening of the 16th century. At an early age he went to Rome and investigated the ancient, especially the subterranean remains, and thence to Pozzuoli, where he painted from the decorations of antique crypts or "grotte." The style of fanciful arabesque which he formed for himself from these studies gained the name of "grottesche," whence comes "grotesque;" not, indeed, that Morto was the first painter of arabesque in the Italian renaissance, for art of this kind had, apart from his influence, been fully developed, both in painting and in sculpture, towards 1480; but he may have powerfully aided its diffusion southward. His works were received with much favor in Rome. He afterwards went to Florence, and painted some fine grotesques in the Palazzo Pubblico. Returning to Venice towards 1505, he assisted Giorgione in painting the "Fondaco dei Tedeschi," and seems to have remained with him till 1511. If we may trust Ridolfi, Morto eloped with the mistress of Giorgione, whose grief at this transaction

brought him to the grave. The allegation, however, is hardly reconcilable with other accounts. It may have been after 1511 that Morto returned to his native Feltre, then in a very ruinous condition from the ravages of war in 1509. There he executed various works, including some frescoes, still partly extant, and considered to be almost worthy of the hand of Raphael, in the loggia beside San Stefano. Towards the age of 45, Morto, unquiet and dissatisfied, abandoned painting and took to soldiering in the service of the Venetian republic. He was made captain of a troop of 200 men; and, fighting valourously, he died at Zara, in Dalmatia, in 1519, or perhaps somewhat later. One of his pictures is in the Berlin museum, an allegorical subject of Peace and War. (From *Ency. Brit.*, 9th ed.)

FEMUR, the thigh-bone in human anatomy. In general terms, it consists of a shaft very slightly curved, and two extremities. The upper extremity bears two projections, called the greater and lesser *trochanters*, for the attachment of muscles, and a short *neck*, nearly at right angles to the shaft, terminated by a hemispherical *head*, which being received into a cavity of the pelvis called the *acetabulum*, forms the hip-joint, a ball-and-socket joint. The lower extremity of the femur has on each side an enlargement called a *condyle*, or knuckle. The articular surface of the condyles is hemicylindrical, as also is the somewhat depressed space between them, called the *trochlea*, and with the large bone of the leg, called the *tibia*, forms a hinge joint. The femur is attached to the pelvis by two ligaments—a capsular ligament, which incloses the head and neck, and the *ligamentum teres*, a sharp ligament which joins the head with the bottom of the acetabulum. It is attached to the tibia by several ligaments, placed in different positions, to combine strength with freedom of motion, the most important of which are the lateral ligaments and the crucial ligaments. The crucial ligaments cross from one member of the joint to the other in oblique directions. Powerful extensor and flexor muscles, besides performing their ordinary functions, aid in keeping the parts in opposition. The femur has a wide range of distribution in the animal kingdom, and is not the exclusive property of warm-blooded animals. In man, it is the strongest, longest, and largest bone. In the whale, it is only rudimentary. In fishes, it is not represented, but has a varying importance in mammals, birds, reptiles, and amphibians. It is a short bone in the ruminants and horse family. In the tortoises, the curve is considerable, while it is almost straight in carnivora, bats, etc. In many reptiles it is slightly rudimentary.

FÉNELON, FRANÇOIS DE SALIGNAC DE LA MOTHE, 1641-79; half-brother of the great archbishop. He was a missionary in Canada, and founded, among the Cayuga Indians who had left New York and settled on the bay of Quinté, an establishment for the education and protection of Indian children. He had a disagreement with Frontenac, the governor of Canada, and was sent back to France.

FENRIR, in Norse mythology, the offspring of Loki (the evil genius) and Angurboda (anguish-boding), a giantess from Jötunheim. Loki had a legitimate wife, Sigyn; but with Angurboda he became the father of three monsters: 1. The wolf Fenrir; 2. the Midgard Serpent; 3. the Goddess of Death, whose name is Hell (the English word "hell" is of similar derivation). The wolf Fenrir was bred among the gods, but only Tyr had the courage to give him food. When the gods saw how much he increased daily, and remembered that the predictions were that he was destined to be their destruction, they endeavored to chain him. But he easily broke the first two chains. Then they made a third. It was composed of the sound of a cat's footsteps, a woman's beard, the roots of a mountain, a fish's breath, and a bird's spittle. Fenrir suspected some trick in this, and he said: "If ye bind me so fast that I cannot free myself again, I am well convinced that I shall wait long to be released by you. I am, therefore, not at all desirous to let the cord be fastened upon me. But rather than that ye shall accuse me of want of courage, let one of you place his hand in my mouth as a pledge that there be no guile in the case." The gods hesitated, but finally Tyr put his hand in the wolf's mouth, and the wolf in his vain struggles to break the chain bit off the hand. Fenrir could not break the magic chain, and became a captive to the gods until Ragnarök—the end of time—comes. Fenrir will then break loose, his upper jaw will touch heaven, his nether jaw the earth; fire will blaze from his eyes and nostrils. In the tremendous tumult which precedes the general dissolution, the wolf will swallow Odin (father of gods), and so cause his death. But at the moment will come Vidar, the silent god, who wears a wonderful shoe made from shoe-parings since time began. With that shoe he will hold down Fenrir's lower jaw, and with his hands tear off the upper jaw, and thus will the monster wolf be slain.

FENTON, a village in Genesee co., Mich., on the Detroit and Milwaukee railroad, 52 m. n.w. of Detroit; pop. 70, 2,353. Water power is furnished by Shiawassee river, and there are a number of manufactories. There are also a Baptist seminary and an Episcopal high school.

FENTON, ELIJAH, 1683-1730; an English poet, master of a free grammar school in Kent. He was tutor to the only son of the earl of Orrery, and on the poet Pope's recommendation gave private literary instructions to Mr. Craggs, secretary of state. He assisted Pope in translating *The Odyssey*. In 1717, Fenton published *Miscellaneous Poems*, and in 1723 appeared *Marianne*, a tragedy. He superintended a new edition of Milton's

poems, and also an edition of those of Waller. The epitaph on his tomb was written by Pope.

FENTON, REUBEN E., b. in w. N. Y., 1819. He studied in the local academies, went into law, and was admitted to the bar, but soon afterwards became a merchant. He was representative in congress from 1857 to 1865. In 1864, he was elected governor of the state, and re-elected in 1866, serving in all four years. In 1869, he succeeded ex-gov. Morgan as U. S. senator, serving for six years.

FENTRESS, a co. in n. Tenn., on the Kentucky border, drained by the head waters of the Cumberland river; 525 sq. m.; pop. 70, 4, 717—170 colored. The surface is rough, and for the greater part covered with timber. Corn, cattle, and hogs are the staple products. Bituminous coal is found. Co. seat, Jamestown.

FENWICK, GEORGE, d. 1657; an English emigrant who settled near Saybrook, Conn., in 1636. He was governor of the colony, with a short interval of absence in England, until Dec., 1644, when he sold his plantation to the Connecticut colony, and returned to England, where he became a col. in the parliamentary army, and was one of the judges on the trial of Charles I.

FENWICK, JOHN, 1618-83; an English Quaker, founder of a colony at Salem, in New Jersey, in 1675. His rights were contested by sir Edmund Andros, governor of New York, and he transferred his claims to William Penn.

FER DE LANCE, *Craspedocephalus lanceolatus*, a venomous serpent of South America and the West Indies. It is very prolific; grows to a length of 5 or 6 ft.; gives no warning of attack, and its bite is often fatal. Those who recover through the application of counter-irritants are usually affected for years with paralysis or diseases of the blood.

FERDINAND I., 1379-1416, of Aragon and Sicily, surnamed THE JUST, was the younger son of John I. of Castile and Leonora of Aragon. On the death of his elder brother Henry III. in 1406, he refused the crown of Castile which the nobles had offered, but in accordance with his brother's will undertook the office of regent during the minority of his nephew John II. In this capacity he distinguished himself by his prudent administration of home affairs, and by his victories over the Moors by land and sea. He took the title *de Antequera* on the surrender of that fortress after a siege of five months, 1410. On the death of his maternal uncle, king Martin of Aragon and Sicily, his claims to the throne, though not derived through the usual laws of descent, were taken up and keenly pressed by a powerful party in the state. The question of the succession was ultimately referred to a committee of nine judges equally representing Catalonia, Valencia, and Aragon; and the result was his election by a majority in 1412. After he had defeated, at Balaguer, count Jayme of Urgel, the last and most formidable of his rivals, he was formally crowned at Saragossa in 1414. From the year 1378, Europe had been scandalized by the spectacle of the papal schism; and since 1410, three rival popes had been claiming the obedience of the faithful. At the council of Constance in 1414, Ferdinand of Aragon was a prominent supporter of the Spaniard, Benedict XIII. (Peter de Luna), who had been deposed at Pisa in 1408. The deposition of John XXIII., and the abdication of Gregory XII. in 1415, having opened the way for peace, Ferdinand consented to be present at the meeting of Sigismund with the ambassadors of France, Castile, and Navarre, in Perpignan; and after long temporizing he ultimately agreed, for the sake of the unity of the church, to withdraw his obedience from Luna. He died in the following year at Ygualada, and was succeeded by his son Alphonso V., the conqueror of Naples. [From *Ency. Brit.*, 9th ed.]

FERDINAND II., King of Aragon and Sicily. See FERDINAND V. (THE CATHOLIC) OF CASTILE, *ante*.

FERDINAND I., 1423-94; King of Naples; illegitimate son of Alphonso V. of Aragon and I. of Naples. He succeeded his father on the throne of Naples in 1458, but the pope favored John of Anjou. The latter invaded the kingdom and defeated Ferdinand, who fled to his capital. But the succeeding pope favored him, and with the assistance of Scanderbeg, the famous Albanian chief, John was defeated with great loss, Aug. 18, 1462. In 1480, the Turks captured Otranto and murdered most of the inhabitants, but in the next year they were driven out and the place recaptured. In 1485, a number of nobles revolted. Ferdinand promised a general amnesty if they would make submission, and then treacherously murdered them. He died just as Charles VIII. of France was about to invade his dominions. His reign favored the advance of his people in knowledge and prosperity.

FERDINAND II., King of Naples, 1468-96; grandson of Ferdinand I., and son of Alphonso II., who abdicated the throne of Naples in the son's favor in 1495. The kingdom was invaded by Charles VIII. of France, and Ferdinand fled. When the French left Naples he was recalled, and, with the aid of Gonsalvo de Cordova, the great general of Ferdinand V. of Spain, he drove out the French invaders a short time before his death.

FERDINAND III., King of Naples. See FERDINAND V. (THE CATHOLIC) OF CASTILE, *ante*

FERDINAND I. 1345-83; King of Portugal, styled *EL GENTIL* (the Gentleman); son of Pedro I. (not Pedro the cruel). He succeeded his father in 1367. On the death of Pedro of Castile in 1369, Ferdinand, as great-grandson of Sancho IV. by the female line, claimed the vacant throne, against the kings of Aragon and Navarre, and afterwards against the duke of Lancaster (married in 1370 to Constance, the eldest daughter of Pedro). Meanwhile, the crown had been actually assumed by Henry of Trastámara, the brother (illegitimate) and conqueror of Pedro. After one or two indecisive campaigns, all parties were ready to accept the mediation of pope Gregory XI. The conditions of the treaty, ratified in 1371, included a marriage between Ferdinand and Leonora of Castile. But, before the union could take place, the former had suddenly become passionately attached to Leonora Tellez, the wife of one of his own courtiers, and having procured a dissolution of her former marriage, he lost no time in making her his queen. This strange conduct, although it raised a serious insurrection in Portugal, did not at once result in a war with Henry; but the outward concord was soon disturbed by the intrigues of the duke of Lancaster, who prevailed on Ferdinand to enter into a secret treaty for the expulsion of Henry from his throne. The war which followed was unsuccessful; and peace was made in 1373. On the death of Henry in 1379, the duke of Lancaster once more put forward his claims, and again found an ally in Portugal; but, according to the continental annalists, the English proved as offensive to their companions in arms as to their enemies in the field; and Ferdinand made a peace for himself at Badajoz in 1382, it being stipulated that Beatrix, the heiress of Ferdinand, should marry king John of Castile, and thus secure the ultimate union of the crowns. On the death of Ferdinand at Lisbon in the following year, leaving no male issue, the direct Burgundian line, which had been in possession of the throne since the days of count Henry (about 1112), became extinct. The stipulations of the treaty of Badajoz were set aside, and John, grand-master of the order of Aviz, Ferdinand's illegitimate brother, was proclaimed. This led to a war which lasted for several years. [From *Ency. Brit.*, 9th ed.]

FERDINAND (AUGUSTUS FRANCIS ANTHONY), b. 1816; titular king of Portugal, duke of Saxony, field marshal-general; married, 1836, to Donna Maria II. da-Gloria Jeanne-Charlotte - Léopoldine - de-Cruz - Françoise - Xaviere-de-Paule - Isidore-Michaëla-Gabrielle-Raphaëla-Louise-Gonzague, queen of Portugal. He received the title in 1837, and after the death of the queen he acted as regent till 1855, during the minority of his son. In 1870, Prim and Serrano offered Ferdinand the crown of Spain, but he declined it. In 1869, he married (in Boston, Mass.,) Eliza Hensler, who had resided in Springfield, the daughter of a German shoemaker, a lady of rare beauty, and afterwards celebrated in America and Europe as a vocalist. She bears the title of countess of Edla. The king without a crown is somewhat celebrated as a painter and engraver.

FERDINAND I. 1000-1065; surnamed *THE GREAT*, first sovereign of independent Castile, was the second son of Sancho III., of Navarre, who, about 1026, compelled Bermudo III., of Leon, the last direct descendant of Pelayo in the male line, to surrender his rights over Castile, and also to give his sister Sancha in marriage to Ferdinand, then regent of that province. Sancho, towards the close of his energetic life, divided his extensive domains among his four sons, Castile being the portion allotted to the second. Bermudo of Leon, shortly after Sancho's death, sought to recover his lost possessions, but was defeated and slain. Ferdinand, now king of Leon as well as Castile, by a conciliatory yet firm policy, soon established his authority over his conquered subjects; and when, in 1053, his dominions were invaded by his brother Garcia III. of Navarre, the attack resulted in the death of the latter on the battlefield of Atapuerca, near Burgos, and the annexation of a large portion of his dominions. At an early period of his reign Ferdinand began to direct his arms against the Moors; and by a series of successful campaigns he extended the Christian frontier from the Douro to the Mondego, and reduced to vassalage the emirs of Toledo, Saragossa, and Seville. Even the Arab chronicles mention his victories from Badajoz, in Estremadura, to Albarracin in Aragon. He had set out on an expedition against Valencia, when he was seized with a mortal illness, which compelled him to retire to his capital, where, after having divided his dominions among his three sons, he died. Ferdinand appears to have laid claim to the title of "emperor" of Spain; and Mariana alleges that at a council held at Florence in 1055, the emperor Henry III., lodged a formal complaint against this infringement of his rights of suzerainty; that this complaint was sustained by Pope Victor II., but that at a conference afterwards held at Toulouse a decision favorable to Ferdinand's imperial rights, so far as they related to the territories which had been conquered from the Moors, was given, chiefly in consequence of the representations made by the famous Cid, Ruy Diaz de Bivar. Though this statement can be received not without reserve, it is certain that both in virtue of the ascendancy he won for himself in Christian Spain, and also in virtue of his notable successes over the Moors, Ferdinand I. is fully entitled to the rank which tradition has assigned him among the greater Spanish sovereigns. [From *Ency. Brit.*, 9th ed.]

FERDINAND II. 1136-88; younger son of Alphonso VIII., became king of Leon on the death of his father in 1157. A dispute that arose between him and some of his powerful nobles gave his brother Sancho III. of Castile a pretext for invading his terri-

tory, but the timely submission of Ferdinand averted serious disaster. The death of Sancho shortly afterwards led to a military occupation of Castile by Ferdinand, professedly in the interests of his nephew Alphonso III.; and this occupation lasted till the marriage of Alphonso to Leonora, daughter of Henry II. of England, in 1170. Meanwhile Ferdinand, having repudiated his wife, Dona Urraca, had become involved in a war with his father-in-law, Alphonso I. of Portugal, which resulted in the defeat and capture of the latter at Badajoz in 1169. The later years of the reign of Ferdinand II. were distinguished by sundry successes over the Moors, especially by a brilliant victory at Santarem; and also by the incorporation of the great military order of Alcantara, which received its first regular charter from pope Alexander III. in 1177. He died at Benavente, Leon, in 1188, and was succeeded by his son Alphonso IX. [From *Ency. Brit.*, 9th ed.]

FERDINAND III., 1200-52, King of Castile and Leon, usually known as SAINT FERDINAND, was the son of Alphonso IX. of Leon, and of Berenguela, sister of Henry I. of Castile. On the death of Henry, without issue, in 1217, the just title of Blanche, the elder of the surviving sisters, was set aside, and Berenguela procured the proclamation of Ferdinand. He rapidly secured the homage of the towns and submission of the nobles, especially of the brothers Alvaro and Ferdinando de Lara. On the death of his father in 1230, he ultimately, though not without dispute, became king of Leon as well as Castile, thus finally uniting the two kingdoms under one crown. Following up the advantage which had been gained for the Christian arms by his father and the allied kings in the great battle at Las Navas de Tolosa in 1212, he devoted all his energies to the prosecution of the Moorish war. Among his conquests may be mentioned those of Ubeda in 1234, of Cordova in 1236, of Jaen in 1245, and of Seville in 1248. He was planning an invasion of Africa, when he died at Seville, leaving his kingdom to his eldest son Alphonso X. Though not canonized till centuries afterwards (by Clement X. in 1671), he came to be popularly known as *el Santo* from a very early period. Distinguished though he was for great military talent, he was still more remarkable for his religious zeal. Like his younger cousin Saint Louis of France, he was supremely a champion of the Roman Catholic faith. It was not on the field of battle alone that his ardor was displayed. None of his Spanish panegyrists fail to relate how it was his wont to assist in carrying wood for burning the followers of the Albigensian heresy, and how sometimes with his own royal hands he applied the torch to the pile. While as a crusader he is hardly eclipsed by Louis, he contrasts very favorably with him as a sincere friend of learning. He was the original founder of the university of Salamanca, which his son and successor did so much to foster and encourage. He it was, also, who caused to be translated into the vulgar tongue the *Fuero Juzgo* or code of Visigothic laws, which, as collected and translated at his instance, has the double interest of being one of the oldest extant specimens of Castilian prose, and also of being the foundation of *Las Siete Partidas*, the code of Christian Spain, which was finally drawn up by Alphonso the wise. [From *Ency. Brit.*, 9th ed.]

FERDINAND IV., 1285-1312; King of Castile and Leon, succeeded his father, Sancho IV., in 1295. The years of his minority were disturbed by a series of civil wars caused by the pretensions of his cousins Don Juan and Don Alonso de la Cerda to the crown, by the disputes of Haros, Laras, and other nobles about their privileges, by the restlessness of the municipalities, and by the ambition of the neighboring kings of Portugal, Aragon, and Granada. The queen-mother, Maria de Molina, on each new outbreak succeeded in procuring peace by diplomatic tact and judicious compromise. Secure at last in possession of his throne, Ferdinand was free to pursue the traditional policy of war against the Moors; and in carrying it out he was aided by pecuniary grants from his own nobles and from the pope (Clement V.), as well as by the spoils of the templars on the extinction of that order in 1310. His chief exploit, as recorded by the historians, both Spanish and Arab, was the expedition against Algeciras in 1309, which, while unsuccessful in its main object, resulted in the surrender of Gibraltar and the cession of other strongholds. In the course of a subsequent campaign he died suddenly at Jaen. According to Mariana, he had on the 8th of Aug. preceding condemned to death without lawful trial two brothers of the name of Carvajal. These protesting their innocence, had summoned him to meet them within thirty days at the bar of God; hence his surname, *el Emplazado*, "the Summoned." He was succeeded by his infant son, Alphonso XI.—[From *Ency. Brit.*, 9th ed.]

FERDINAND VI., 1713-59; King of Spain, sometimes called THE SAGE, the younger son of Philip V. and Maria Louisa of Savoy. On the death of his elder brother, Louis, in 1758, Ferdinand was proclaimed prince of the Asturias; and in 1759 he was betrothed to Barbara, daughter of John V. of Portugal. He succeeded his father on July 9, 1766. Since 1759, Spain had been involved in protracted war, first with England in consequence of disputes relative to British interests in the West Indies, and afterwards, since 1740, with Austria on the accession of Maria Theresa. It was Ferdinand's first endeavor on coming to the throne to secure peace for his exhausted country, and one of the earliest acts of his government was to order the withdrawal of the Spanish troops from Italy. Soon afterwards negotiations were opened for peace with England; and these, though frequently interrupted, ultimately resulted in the treaty of Aix-la-Chapelle,

which terminated the war of the Austrian succession, thus restoring peace to Europe, Oct., 1748. Weak in health and despondent in temperament, Ferdinand had no inclination thenceforward to take an active part in European affairs, and the management of the public business he abandoned almost entirely to his ministers Ensensada, Carvajal, and Wall. These, however, always found it necessary to take into their counsel the queen, to whom Ferdinand was much attached, the royal confessor Rabago, and the singer Farinelli, whose musical powers had given him extraordinary influence. During this reign the condition of Spanish finance was much improved; agriculture, commerce, and the arts were encouraged; by a concordat with pope Benedict XIV. in 1753, many abuses of ecclesiastical patronage were reformed; and the affairs of the army and navy were not neglected. On the outbreak of the seven years' war in 1756, Spain steadfastly maintained a strict neutrality, notwithstanding the repeated efforts of both France and England to secure her intervention, the former offering Minorca and the latter Gibraltar as the price of her assistance. On the death of his consort in 1758, Ferdinand fell into a profound melancholy, which issued in a confirmed insanity, under which he died at Villaviciosa. Leaving no issue, he was succeeded, according to the terms of the treaty of Aix-la-Chapelle, by his half-brother, Charles III.—[From *Ency. Brit.*, 9th ed.]

FERGHANA, a province of Russian Turkestan, comprising a valley surrounded on three sides by the w. ranges of the Thian Shan mountains; pop. '70, 960,000, of whom one third are nomads. The productions are wheat, rice, maize, sorghum, millet, cotton, tobacco, madder, etc. The climate is equable and generally healthy. Rock salt, naphtha, gypsum, iron, lead, coal, and sulphur are found. The Russians have divided the province into seven districts. The affairs of the nomads are managed by their own elders.

FERGUSON, JAMES, 1797-1867; b. Scotland; came to New York in 1800. He was one of the engineers who laid out the Erie canal, and in 1819-22, assistant surveyor in the boundary commission under the treaty of Ghent; and astronomical surveyor for that commission in 1822-27. He became first assistant of the U. S. coast survey in 1833, and in 1847, assistant astronomer of the U. S. naval observatory. He discovered the following asteroids: Euphrosyne in Sept., 1854; Virginia in 1857; Echo in 1860, for which he was awarded the astronomical prize medal by the academy of sciences of France. He was contributor to Dr. Gould's *Astronomical Journal* and to the *Astronomische Nachrichten*; also to the *Episcopal Church Review*, to the *Merchants' Magazine*, and to other standard publications.

FERGUSON, JAMES, b. Scotland, 1808; educated in Edinburgh and in England, and went into business in India. This he soon gave up and journeyed through various parts of the east, chiefly with a view of studying the styles of architecture. One of the first results of his studies was *Illustrations of the Rock-cut Temples of India*. He also published *Picturesque Illustrations of Ancient Architecture in Hindustan*; *Essay on the Ancient Topography of Jerusalem*; and a *Historical Inquiry into the True Principles of Art, more especially with reference to Architecture*. This volume is the first of a projected work in three parts, comprising a universal compendium of past art—Hindu, Mohammedan, Gothic, etc. The materials collected for this work were used in his *Handbook of Architecture*, published in 1855. Later he issued an *Essay on a Proposed New System of Fortification*, by earthwork. A pamphlet of practical suggestions for the improvement of the British museum and of the national gallery was followed by a "New Design" for the latter at the academy exhibition of 1850. He is also the author of *The Palaces of Nineveh and Persepolis Restored*, published in 1851, and was the architect of the Nineveh court in the crystal palace, Sydenham. Since 1859, he has been one of the royal commissioners to inquire into the defenses of the United Kingdom. In 1862, Mr. Ferguson published a *History of the Modern Styles of Architecture* as a sequel to the handbook, and in 1865 remodeled the whole, and published it as *A History of Ancient and Modern Architecture*, in 3 vols. In addition to these works, he published, in 1868, *Tree and Serpent Worship*, with upwards of 100 plates and illustrations. In 1871, he received the royal gold medal, annually awarded to an eminent architect, or writer on architecture. His latest work is entitled *The Temples of the Jews and the other Buildings in the Haram Area at Jerusalem*.

FERGUSON, Sir WILLIAM, 1808-77; a Scotch surgeon, educated in Edinburgh university. At the age of 20 he became a licentiate of the college of surgeons, and in the following year a fellow. In 1836, he was surgeon to the royal infirmary, and in 1840, professor of surgery in King's college, London. In 1849, he was appointed surgeon-in-ordinary to the prince consort, and in 1860, sergeant-surgeon to the queen. He was celebrated for self-possession in critical circumstances, attention to details, and refinement of touch; and relied more on his mechanical dexterity than on complicated instruments.

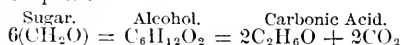
FERID-EDDIN-ATHAR, or FARID-UDDIN-ATTAR, 1119-1229; a Persian poet and mystic, who died at the age of 110 years. He was Mohammed ben Ibrahim, the son of a druggist, and brought up to his father's business. "Ferid-Eddin" was an honorary title, signifying "pearl of religion." To this he added "athar" (which means "druggist"), and so quite changed the real name. He studied the mystic philosophy of the Sufis, and was recognized as one of its principal representatives. He was a voluminous

writer, leaving no fewer than 120,000 couplets of poetry. His most famous work is the *Mantic Uttair*, or language of birds, an allegorical poem containing a complete survey of the life and doctrines of the Sufis. According to the poet, the birds, weary of a republic, longed for a king. As the lapwing, having guided Solomon through the desert, best knew what a king should be, he is asked whom they shall choose. "The Simorg in the Caucasus," is his reply. But the way to the Caucasus is long and dangerous, and most of the birds excuse themselves from the journey. A few, however, set out; but by the time they reach the great king's court, their number is reduced to 30. The 30 birds, wing-weary and hunger-stricken, at length gain access to their chosen monarch, the Simorg; but only to find that they strangely lose their identity in his presence—that they are he, and he is they. In such strange fashion did the Persian poet image forth the search of the human soul after God, and its absorption into the divine.

FERISHTA, MOHAMMED KASIM, a Persian historian, author of a history of India, reputed to be one of the most trustworthy of oriental historians. He gives a brief history of the country prior to the Mohammedan conquest, and of the victorious progress of the Arabs through the east; following with a history of the kings of some of the provinces, of the Mussulmans of Malabar, the Mussulman saints of India, and the geography and climate of the country.

FERMENTATION (*ante*), a chemical term originally applied to natural processes in which bubbles of air seem to be generated, producing what is called effervescence. Effervescence is, however, only a phenomenon which accompanies one of the most familiar instances of fermentation, and does not exist in all its forms. The commonest examples of fermentation are: the change of the juices of fruits to wine, cider, etc.; the souring of milk; and the putrefaction of animal or vegetable matter. As these changes occur without any notably exciting cause, they have been thought to be spontaneous; but no such thing as simple spontaneity exists in the case. On the contrary, experiment shows that no fermentable chemical species will ferment except it is in the presence of water, and is kept by that water in contact with some specific substance which by its presence excites and maintains the chemical activity of the kind in question. The substance which is thus the occasion of the chemical action is called a ferment. Even the simple fact of presence is not deemed to be enough. The ferment must itself change, but the cycle of change may cause a continuous reproduction of the agency, and thus result in the continuity of the fermentation.

Vinous fermentation may be selected for illustration, as one which is familiar in some of its many illustrations, such as the making of wine from grapes and currants, cider from apples, beer from grain, etc. The juice of grapes is an intensely sweet yellowish liquid, which may be made perfectly limpid and transparent by filtration through bibulous paper. If thus clarified, it will remain unchanged indefinitely; but if to it be added even a small quantity of the unclarified juice, fermentation will ultimately begin, and the liquid will become turbid. A finely divided substance is formed in the liquor, which rises to the surface as a scum, and is called yeast. The production of yeast is accompanied by the evolution of carbonic acid, which also comes to the surface, and is retained in bubbles by the viscous nature of the scum. The chemical change once begun becomes accumulatively more active in the presence of the increasing volume of yeast, until it reaches a climax, and then it dies away because the whole substance has been acted upon. The yeast settles to the bottom; a clear liquid remains, whose sweetness has given place to a vinous taste; from which it appears that the sugar has vanished, and instead, a new, volatile, inflammable substance called alcohol is present. The temperature of vaporization being lower for alcohol than for water, it may be driven off by processes of distillation, each repetition furnishing a greater proportion of alcohol, and may finally be obtained in a pure, or "absolute," form, when treated with some chemical which takes away the remnant of the water. It appears then that the vinous fermentation has occasioned a change in which sugar has given place to alcohol. The analytical statement of this change is expressed by Gay Lussac's formula, substantially, but not critically. He assigned to grape sugar the simple formula CH_2O , and for the reaction gives the equation—



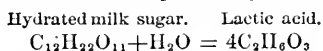
or, 45 units of sugar give 23 units of alcohol and 22 of carbonic acid. Cane sugar has the formula, $\text{C}_{12}\text{H}_{22}\text{O}_{11} = 2(\text{C}_6\text{H}_{12}\text{O}_6) - \text{H}_2\text{O}$, or, two equivalents of grape sugar with one of water. It appears, on further investigation, that certain other compounds are formed—thus 100 parts of cane sugar become, by absorption of water, 105.4 parts of glucose, which yield approximately—

Alcohol.....	51.1
Carbonic acid.....	49.4
Succinic acid.....	0.7
Glycerine.....	3.2
Matter passing to yeast.....	1.0
Total.....	105.4

even this does not account for the formation of a small quantity of fusel-oil, and some ethers.

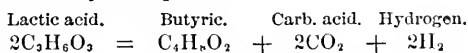
Vinous fermentation is induced by *saccharomyces*, a genus of fungi, consisting of minute cells, sometimes isolated, sometimes grouped, but never forming a continuous tissue. Of the several species, *S. cerevisiæ*, the fungus of common yeast, used in making beer, is most important. Its cells have a diameter of about $\frac{1}{100}$ millimeter. Of the genesis of the yeast plant little is known. Its germs abound in harvest time about the vines and stalks of the grape, and in breweries and wine-cellars, but they are by no means generally diffused through the air.

The change in lactic fermentation is expressed by the equation—



Ordinary glucose dissolved in milk ferments to lactic acid, with the milk sugar, up to a certain maximum of acidity, when the change stops. Chalk or carbonate of soda neutralizes a part of the acid, and revives the fermentation. The agent of this fermentation is a microscopic fungus, consisting of single cells, much smaller than those of the brewers' yeast. Lactic ferment sometimes annoys brewers as an impurity in their yeast. The lactic ferment is not chargeable as the agent which ordinarily sours milk; this result is caused by a motionless bacterium which Lister calls *B. lactis*. Yet this bacterium, if made to pass through a certain round of changes, also produces lactic fermentation. The germs of this bacterium are thought to abound in the air of dairies and cow-stables, but are not generally diffused through the air.

Butyric fermentation is a change which occurs in milk or cheese, in which the lactic acid is broken up, as shown by the equation—



It is caused by the presence of an animalcule called a *vibrio*. This fermentation is one of a series of fermentations called putrefaction, of which the chemical reactions are very intricate. The agents are, with scarcely an exception, bacteria and vibrios.

FERMENTED AND DISTILLED LIQUORS, STATISTICS OF (ante). An account of the liquor traffic in the United States for the year ending June 30, 1872, based on the internal revenue report for 1872, and the census returns of 1870, shows the following figures:

Number of distilleries.....	3,132
Number of breweries.....	3,421
Number of licensed retail dealers.....	161,144
Number of wholesale dealers.....	7,276
Sales of retail dealers, est., \$5,000 each.....	\$805,720,000
Gallons of distilled liquors produced.....	69,033,533
Barrels of fermented liquors.....	8,039,969
Total, imports added, gallons.....	337,288,066
Total cost.....	735,720,048

From the official report of the United States internal revenue department for the year ending June 30, 1879, it appears that the revenue derived from distilled liquors in that year was as follows:

Brandy distilled from apples, peaches, or grapes.....	\$919,052 53
Spirits distilled from other materials.....	46,790,411 30
Rectifiers' special tax.....	160,123 21
Retail dealers.....	3,903,036 24
Manufacturers of stills, and stills and worms manufactured... ..	3,525 85
Stamps for distilled spirits for export.....	17,212 20
Warehouse, rectifiers', and dealers' stamps.....	292,907 90
Interest on tax upon spirits.....	74,899 48
Total revenue from distilled spirits, year ending June 30, 1879.....	52,570,284 69
Revenue in the same year from fermented liquors.....	10,729,320 08
Total revenue from both kinds.....	63,299,604 77

The *National Temperance Almanac* for 1880 says: The select committee of the British house of lords lately made a report in which it was stated that the amount expended in that country for intoxicating liquors rose from £84,222,171 in 1860, to £147,288,759 in 1876. The consumption of alcohol as a beverage rose from about four gallons per head in 1856 to nearly double that sum in 1875. From other sources it is learned that in the year ending Sept. 30, 1878, licenses were issued in the United Kingdom to 2,641 common brewers, not licensed to sell beer by retail; to 99,337 victualers; to 28,453 keepers of houses where beer may be drunk on the premises, and 6,691 where beer may not be consumed on the premises. Licenses were also granted to 14,948 victualers and 7,158 keepers of beer-houses who brew their own beer. The quantity of malt consumed by common brewers during the year was 50,362,815 bushels; by victualers, 6,704,340 bushels; by persons licensed to sell beer to be drunk on the premises, 2,868,767 bushels;

and by persons licensed to sell beer not to be drunk on the premises, 594,083 bushels. During the year ending on the 31st Dec., 1879, 58,543,252 bushels of malt were made in the United Kingdom, and the duty charged amounted to £7,939,099. The total amount realized for brewers' licenses was £411,831, and the declared value of beer exported from the United Kingdom was £1,918,886.

FERN, FANNY. See PARTON, JAMES.

FERNANDEZ, JUAN, a Spanish discoverer. While sailing along the coast of South America early in the 16th c., he found that the winds near the shore were almost constantly from the s., and that they greatly retarded his progress. Standing off shore he met the trade-winds which blew from a different direction, and made a voyage so remarkable for its short time that he was, on returning to Spain, arrested on a charge of sorcery. By some unusual leniency, however, his explanation was accepted and he was acquitted. During one of his voyages, 1563, he discovered the islands which now bear his name. See JUAN FERNANDEZ, *ante*. He was so pleased with their fertility and beauty, that he asked for their possession, and the Spanish government gave them to him in 1572. A colony was established, but it was not permanent, and the only relic of it is the goats, which have continued to thrive ever since. In 1574, he discovered the islands of St. Ambrose and St. Felix. His companions during a voyage made in 1576 say that he saw a large island or continent in the southern ocean. This, if not an illusion, may have been New Zealand, or Australia.

FERNANDINA, port of entry and seat of justice in Nassau co., Fla., on Amelia island, Atlantic coast, at the e. end of the Atlantic Gulf, and West India Transit railroad, which runs across Florida in a s.w. direction to Cedar Keys, on the gulf of Mexico; pop. about 2,500. It has an excellent harbor, considerable trade, and some manufactures. It is the seat of a Roman Catholic seminary. In the winter it is a place of resort for people from the north, seeking a milder climate.

FERNS (*ante*), a group of cryptogamous or flowerless plants, much prized for their beauty, of which more than 2,500 species have been described by botanists. They formed a prominent feature in the vegetation of the early geological ages, and are found at present in every quarter of the globe, being comparatively few and small in cold climates and large and abundant in the tropics. They grow from a woody stem that first creeps along or under the ground, then becomes erect, and sends forth from the sides, or at the top, leaves or fronds of varied and most curious patterns. They vary in size in different climates, from herbaceous perennial plants with a slight stem producing leaves often less than half an inch in length, to trees rising in the tropics to a height of from 50 to 60 ft., and sending out at the top a beautiful crown of fronds from 8 to 20 ft. in length. Ferns are fructified from the lower face or the edges of the fronds, on which are collections of capsules filled with seeds or spores. A spore on germination produces a structure which, compared with its immediate parent, is very small, and bears no resemblance to it in form or texture. It is called the prothallium, and its function is entirely reproductive; it develops sexual organs of two kinds, archegonia and antheridia, either on the same or different prothalia. Hence, in contradistinction to the sporophore—the function of which in this group of plants is purely vegetative—the prothallial generation is termed the oophore. The whole group of ferns (pteridophyta) has been classed as follows:

PTERIDOPHYTA.—Cormophyta with two distinct stages in the life-cycle. Sporophore with high vegetative differentiation. Oophore inconspicuous and destitute of vascular tissue.

Class I. *Filicinae*.—Leaves highly developed. Sporangia numerous on the fertile leaves.

Sub-class 1. *Filices*.—Leaves without stipular appendages. Sporangia epidermal, containing spores of one kind developed in each from a single primary mother-cell.

Sub-class 2. *Stipulatae*.—Leaves with stipula-like appendages. Sporangia containing spores of one kind developed in each from many endogenous primary mother-cells.

Class II. *Equisetinae*.—Leaves rudimentary. Sporangia 5 to 10 on the fertile leaves.

Class III. *Lycopodinae*.—Leaves small (except isoetes), simple. Sporangia solitary.

Sub-class 1. *Lycopodiaceae*.—Spores of one kind.

Sub-class 2. *Ligulatae*.—Spores of two kinds.

FERRARA, COUNCIL OF. The council of Basle, convened in 1431 to promote the reform of the church, having entered heartily into the work, was opposed by pope Eugenius IV., who, in 1437, issued a bull transferring the sessions to Ferrara. He was obeyed by only cardinal Julian, the president, and four bishops; the council itself continued in session at Basle, declaring the act of the pope in attempting to transfer it illegal, and pronouncing against him sentence of suspension. To the five delegates, however, who met at Ferrara, others fresh from their homes were added, so that at the second session 72 bishops were present, over whom the pope presided. These were soon joined by the emperor from Constantinople, John Palaeologus, who brought with him patriarchs, bishops, and other ecclesiastics, amounting in all to 700 persons. His object

in coming was to effect the reunion of the Greek and Latin churches, in the hope that he could thus secure the aid of the west against the Turks, who were then pressing hard upon the empire, and were destined (as afterwards shown) soon to overwhelm it. The points of difference between the churches formed the chief subjects of discussion until the opening of the year 1439, when, on the plea that the plague was prevalent at Ferrara, the sessions were transferred to Florence. (See FLORENCE, COUNCIL OF.)

FERRIC OXIDE, the PEROXIDE, or SESQUIOXIDE OF IRON, Fe_2O_3 . The anhydrous peroxide, as found in nature, crystallizes in flattened, rhomboidal tablets, nearly black and very brilliant, known to mineralogists as "specular iron;" it also occurs in compact red masses, called "red hematite." Prepared artificially, by calcining ferric protosulphate, or copperas, it is a red powder, called colcothar, used as a paint, and for polishing silver and mirrors. Magnetic iron ore is commonly held to be a compound of ferric oxide and ferrous oxide, $\text{Fe}_2\text{O}_3 + \text{FeO} = \text{Fe}_3\text{O}_4$.

FERRY (*ante*), in the United States, usually an important and valuable property, owned or assumed by the local governments, and regulated by laws. The city of New York holds the right to control ferries from the English colonial charter, and no ferry can be started to or from the island on which the city stands without consent of the corporation. But usually one state has the right to establish a ferry over a navigable river separating it from another state, although its jurisdiction may not extend beyond the middle of the stream. In the case of New York city, the corporate rights extend to low-water mark on the opposite shores, and therefore the city practically controls all ferries. Ferry franchises are commonly protected by their express terms from infringement or rivalry. The franchise of a ferry is an incorporate hereditament, is subject to dower, may descend to heirs, may be leased, sold, and assigned; but inasmuch as the people have an interest in it, it is subject to legislative regulations for the protection and enforcement of public rights. Controllers of ferries and carriers are subject to all laws affecting such public servants, with respect not only to care of property, but also to safety of life. Tenants or lessees of ferries are owners in law in case of injury.

FERSEN, AXEL, Count, 1755-1810; marshal of Sweden, son of count Axel, a state senator; educated by his father, and in the Turin military academy. He was aide to Rochambeau in the American revolution, and was present at the surrender of Yorktown. Returning to France at the time of the French revolution, he became a warm friend of the royal family. When they fled from Paris he disguised himself and acted as their coachman, conducting them as far as Bondi, whence they were sent on under other care. After the failure of the scheme and the imprisonment of the royal family, he exerted himself in every way for their comfort. After their execution he returned to Sweden, and became chancellor of Upsala university. Not long after, he was plenipotentiary to the Rastadt congress. When the crown-prince of Sweden suddenly died in June, 1810, Fersen and his sister were suspected of procuring his death by poison. At the funeral they were attacked by the mob, and he was slain, the sister escaping. Their complete innocence was afterwards satisfactorily proved.

FERTILIZERS. See GUANO, MANURES, PHOSPHATES, *ante*.

FESSENDEN, FRANCIS, b. Maine, 1839; graduated at Bowdoin, and studied law. In 1861, he was appointed capt. of infantry; was wounded at Shiloh, became col. of volunteers, and commanded a brigade at Chantilly, and at other places. He received a number of promotions, and in 1866 was appointed lieut.col. of the 28th U. S. infantry.

FESSENDEN, THOMAS GREEN, 1771-1837; b. N. H.; graduated at Dartmouth in 1796; studied law, and occupied his leisure hours in writing humorous and sarcastic verses for a newspaper edited by Joseph Dennie. In 1803, he published in London, anonymously, *Terrible Tractoration*, a satire upon the medical profession, and especially upon the then famous metallic tractors of Dr. Perkins. The work was enlarged, and reached a third edition. In 1822, he started the *New England Farmer*, with which he was connected until his death. Among his works are *Democracy Unreiled*; *American Clerks' Companion*; *The Ladies' Monitor*; *Laws of Patents for New Inventions*. For two years he edited the *Weekly Inspector* in New York city.

FESSENDEN, WILLIAM PITT, LL.D., 1806-69; b. N. H.; graduated at Bowdoin in 1823; admitted to the bar in 1827, and soon afterward made his home in Portland, Me. He was a member of the state legislature in 1832; of congress in 1841; and of the U. S. senate in 1853. Being rechosen in 1859, he was appointed chairman of the finance committee, and throughout the war of the rebellion rendered valuable service by aiding the secretary of the treasury to maintain the national credit, as well as by his counsel in the senate chamber. In 1864, on the retirement of Mr. Chase from the secretaryship of the treasury, he accepted that portfolio, and discharged the duties of the office during a most critical period of the nation's finances, until Mar., 1865, when, owing to failing health, he resigned, and resumed his seat in the senate, to which he had been re-elected. He began his career as an ardent whig; was a member of the whig national conventions of 1840 and 1848, in the latter advocating the nomination of Webster; but in the convention of 1852, he opposed Webster, and favored Scott. He was one of the founders of the republican party, in which he became a prominent leader.

FESTUS PORTIUS, successor of Felix as procurator of Judea; sent there by Nero about 60 A.D. It was he who heard the case of the apostle Paul, whom Felix had left prisoner, and but for the fact that Paul had already appealed to Rome he would have set the apostle free. He had some difficulties with the Jews, but none of great importance. Josephus gives him the character of a just and vigilant magistrate.

FETIALES, or **FECIALES**, Roman officers who acted in international affairs as heralds in the announcement of war to a foreign state, and by presiding over the solemnities attending the return of peace. Their duties were discharged with much ceremony. They were anciently citizens of high birth, were chosen for life, and were called *patres patrati*.

FÉTIS, **FRANÇOIS JOSEPH**, 1784-1871. He was the son of an organist, and played the organ in his native town (Mons, Belgium), when only 10 years of age. He received his musical education from the leading teachers at Paris, and then traveled in Germany and Italy, studying the works of the great masters. In 1806, he returned to Paris, married a wealthy lady, and was enabled to devote his time to studying the history of music. In 1813, financial misfortunes compelled him to return to the practice of his profession, and he accepted the position of organist and instructor at Douai. In 1818, he became a professor in the conservatory of Paris, and published about this time his *1 traité du Contrepoint et de la Fugue*. In 1827, he founded and edited the *Revue Musicale*, a journal devoted to musical criticism. The time that he could spare from professional duties was devoted to researches upon the theory of harmony, to the preparation of articles for a number of journals, and to the composition of operas and pieces of sacred music. In 1833, he was appointed chapel master and director of the royal conservatory of Brussels. In 1864, according to instructions left in the will of Meyerbeer, he became his musical executor, and superintended the production of the opera *L'Africaine*. The most successful of his own operas was *La Vielle*, which had a run of 100 nights. His principal works are: *Biographie Universelle des Musiciens et Bibliographie Générale de la Musique*, and his *Traité Complet de la Théorie et de la Pratique de l'Harmonie contenant la Doctrine de la Science et de l'Art*.

FEUILLET, **OCTAVE**, b. 1812; a French novelist and dramatist; was educated in the college of Louis-le-Grand, of Paris. His early writings were published under the name of "Désiré Hazard," *Le Grand Vieillard*, written in 1844, conjointly with Paul Bocage and Albert Aubert, being the first. Feuillet afterwards became a constant contributor to newspapers and reviews, besides writing many comedies, dramas, and farces, which achieved popularity. He was elected to the French academy in 1862, and in the following year was made an officer of the legion of honor. Afterwards he was appointed librarian of the imperial residences, which position he held until the revolution of Sept., 1870. His most noteworthy dramatic productions are: *La Nuit Terrible*; *Le Bourgeois de Rome*; *La Crise*; *Le Pour et la Contre*; *Péril en la Demeure*; *La Fée*; *Le Village*; *Dalila*; *Le Roman d'un Jeune Homme Pauvre*; *La Tentation*; *La Rédemption*; *Montjoie*; *La Belle au Bois Dormant*; *Le Cas de Conscience*; *Julie*; *La Clé d'Or*, a comic opera; and *L'Acrobate*. Among his novels are *Polichinelle*; *Onesta*; *Rédemption*; *Bellah*; *Le Cheveu Blanc*; *La Petite Contesse*; *Le Roman d'un Jeune Homme Pauvre*, which has been translated into many languages; *Histoire de Sibylle*; *Monsieur de Camors*, a story remarkable for invention and vigor; *Julia de Tréceur*; *Un Mariage dans la Monde*; and *Le Journal d'un Femme*. He is also the author, jointly with Paul Bocage, of a number of other dramas, and has published several poems.

FÉVAL, **PAUL HENRI CORENTIN**, b. 1817; a French writer of fiction, bred to the law, which he soon abandoned for authorship. His novels are numerous, and a number of them have appeared in English, among them *The Loves of Paris*; *The Duke's Motto*; *The Woman of Mystery*; *Thrice Dead*, etc. In 1876, he became a Roman Catholic, and wrote in defense of the Jesuits.

FEVER BUSH, a shrub common in the northern states, remarkable for graceful form and beautiful leaves; the *benzoin odoriferum* of Nees. It is from 4 to 10 ft. high, and grows best in moist and shady places. A decoction of the twigs is used as stimulant in fevers, and to cure the itching which follows vegetable poisoning. The berries have occasionally been used as a substitute for allspice, and sometimes the shrub is called spice bush.

FEW, **WILLIAM**, 1748-1828; lived in North Carolina, Georgia, and New York. He was a member of the convention to frame the constitution for Georgia; a member of the state assembly, and of the council. He was a col. in the revolution, surveyor-gen., judge of a county court, and delegate to the continental congress. He assisted in framing the federal constitution, and in urging its adoption by his state. Subsequently, he was a member of the two constitutional (state) conventions, and United States senator.

FIACRE, **SAINT**, an anchorite said to have been a son of Eugenius IV., king of Scotland. He lived in the 7th c., and voluntarily renounced the world, going to France to counsel with St. Faro, bishop of Meaux. The bishop gave him a residence in the forest of Breuil, in Brie, where he built a cell and gave asylum to such strangers as fell in his way. After his death, about 670 A.D., his shrine had the reputation of working miracles, and pilgrimages to it began. These pilgrimages created such a demand for con-

veyances as to give the name of the saint to a hackney-coach, which in France is called a *fiacre*. St. Fiacre is the patron saint of gardeners.

FICHTELGEBIRGE, a mountain group of Bavaria forming the center from which three extensive mountain ranges proceed. The highest points are 3,490 and 3,340 feet. There is abundance of wood, as well as of iron, sulphur, vitriol, lead, copper, and many kinds of marble. The people are chiefly employed in mining and smelting. Objects of interest in the region are the celebrated watering-place of Alexandersbad, and the sandstone labyrinth of Luisenburg.

FIELD, CYRUS WEST (*ante*), b. Stockbridge, Mass., 1819; brother of David Dudley. He left his home at the age of 15 to enter a mercantile house in New York, and a few years later was the head of a prosperous concern. Retiring from business in 1853, he traveled for seven months in South America with Mr. Frederic E. Church, the artist, and on his return was applied to for aid in building a telegraph line in Newfoundland—an undertaking which had been begun, but had proved a total failure. The plan was to carry the line across that island to St. John's, the furthest point on the American coast, and there connect with a line of fast steamers, which, it was thought, could reach the nearest point in Ireland in five days. Thus America could be brought easily within a week of Europe. While Mr. Field was considering this proposal, and turning over the globe in his library, the thought flashed upon him, "Why not carry the line across the ocean?" In this was the germ of that project of an Atlantic telegraph to which he was to devote the next 13 years of his life. Having obtained, in 1854, from the legislature of Newfoundland, the exclusive right for 50 years of landing telegraph cables from Europe and America on the island, he formed a company known as the "New York, Newfoundland, and London Telegraph Company." In 1856, he went to London and organized the "Atlantic Telegraph Company." Mr. Field furnished one fourth of the capital, and the United States and British governments provided ships for the undertaking. The expeditions of 1857, the two of 1858, and those of 1865 and 1866 were mainly due to his efforts of organization, for although the first two were failures, and the cable laid by the third worked but four weeks, he never lost faith in the enterprise. In 1866, however, a cable was finally laid, and the cable of 1865 was picked up in mid-ocean by the *Great Eastern*, joined to the cable on board, and the western terminus was safely landed.

The success was complete, and in both countries honors were showered upon the leaders of the expedition. In England several were knighted, and others made baronets; and the prime minister, in conferring these rewards, said that the only reason why Mr. Field was not included in them was that it was felt that any title or dignity might not be acceptable to an American citizen. But he had honors enough at home. Besides innumerable congratulations, he received the unanimous thanks of congress, with a gold medal, and other testimonials for what was recognized as one of the most remarkable achievements of the century. The French exposition of 1867 awarded him the grand medal, its highest award, given only to those who were recognized as great public benefactors.

Since then, while enjoying the fruits of his chief work, he has not been idle in other directions. He has taken interest in the different submarine cables in the Mediterranean and in the east. Within the last three years he has devoted much of his thought and of his capital to the establishment in New York of the system of elevated railroads, which have supplied a want long felt, and proved an inestimable blessing to the city. He has still one more dream of his life, to lay a telegraphic cable across the Pacific, and thus complete the circuit of the globe. See ATLANTIC TELEGRAPH.

FIELD, DAVID DUDLEY, D.D., 1781-1867; born in East Guilford, now Madison, Conn.; graduated from Yale college in 1802; studied for the Congregational ministry, and in 1804 was settled at Haddam, on the Connecticut river; in 1818, was called to Stockbridge, Mass.; in 1837, he was recalled to his old parish in Connecticut, where he spent the last fourteen years of his active ministry. In 1851, having reached the age of seventy, he returned once more to Stockbridge, and there passed the evening of his life, greatly respected as one of the most venerable ministers of New England. He was the author of several local histories, such as that of Middlesex co., Conn., and of the city of Middletown; of Berkshire co., Mass., and of the town of Pittsfield; and of a genealogy of the Brainerd family. He also published a number of sermons.

FIELD, DAVID DUDLEY, b. Haddam, Conn., 1805; an eminent lawyer; son of David Dudley, D.D. He graduated at Williams college in 1825, studied law, and was admitted to the bar in 1828. He commenced practice in New York, where he has been a conspicuous figure at the bar for more than fifty years. Besides a very large professional practice, he devoted all the time which he could spare from pressing engagements for forty years to the reform of the law. He began the movement by writing articles in reviews and papers and pamphlets, showing the urgent necessity of reconstructing the modes of legal procedure. Having been appointed in 1847 a commissioner on practice and pleadings by the legislature of New York, he devoted himself first to the preparation of a code of civil procedure. The design of the new system of civil procedure was to wipe out the distinction between the forms of action, and between legal and equitable remedies, in order that all the rights of the parties in relation to the subjects of litigation could be decided

in a single action, instead of dividing them, as formerly, between different suits. This system has been adopted in 24 states and territories, and has been substantially followed by Great Britain and many of her dependencies. The same commission framed a code of criminal procedure, which has been adopted by 15 states and territories. In 1857, Mr. Field was placed at the head of a new commission to prepare a political code, a penal code, and a civil code, which were finished and reported, but have not been adopted by the state of New York, though the civil and penal codes were passed by the two houses, almost unanimously, in 1879, and failed only for want of the governor's signature. They have been of great service, however, in the legislation of other states, especially in California, where they were adopted with a few alterations that were necessary in order to adapt them to the condition of that state. In 1866, the British association for the promotion of social science held a meeting at Manchester, at which Mr. Field made a proposal for a general revision and reform of the law of nations, similar to that aimed at in his labors for the reform of the civil and criminal law. Acting on his proposal, he completed, in 1873, a work entitled *Outlines of an International Code*, which he presented to the social science congress of that year. It met with very favorable criticism from eminent jurists all over the world.

In 1873, he was elected first president of an association for the reform and codification of the law of nations, formed at Brussels in that year. This association has for one of its great objects the substitution of arbitration for war in the settlement of disputes between nations.

FIELD, HENRY MARTYN, D.D., b. Stockbridge, Mass., 1822; brother of David Dudley. After graduating from Williams college, he studied theology, and was ordained pastor of a Presbyterian church in St. Louis in 1842. He resigned this position in 1847 to go abroad, and spent a year in Europe. 1848 was the year of revolutions. He was in Paris during the three days of Feb. when Louis Philippe was overthrown, and wrote a very full description of the scenes of which he was an eye-witness. On his return he published also a sketch of the Italian revolutions, and a letter from Rome on *The Good and the Bad in the Roman Catholic Church*. At this time he wrote *The Irish Confederates: a History of the Rebellion of 1798*. In 1851, he was settled as pastor of a Congregational church in West Springfield, Mass., and in 1854 removed to New York, to become one of the editors of *The Evangelist*, a well-known religious journal, of which he is now sole proprietor. After making a second tour in Europe in 1858, he published *Summer Pictures: from Copenhagen to Venice*; and in 1866, he issued *The History of the Atlantic Telegraph*. In 1867, he was a delegate to the Free church of Scotland and the Presbyterian church of Ireland, and visited the great French exposition. In 1875-76, he spent a year and a quarter in a tour around the world, which furnished the material for two volumes, *From the Lakes of Källarney to the Golden Horn*, and *From Egypt to Japan*, which have had a remarkable popularity.

FIELD, JOHN, 1782-1837; an English pianist and musical composer, a pupil of Clementi, whom he accompanied on a concert tour through Europe. In Russia, after separating from Clementi, he was remarkably successful, but his extravagance kept him always poor. An unhappy marriage with a French lady was speedily dissolved. He was not a prolific writer, but he left many works not easily forgotten. His nocturnes need no other claim to immortality than the fact of their being the inspiration on which Chopin worked.

FIELD, JOSEPH M., d. 1856; an actor and dramatist, b. England, but for many years a resident of New Orleans, where he produced a number of plays. He was widely known as "Straws," a humorous writer on the *New Orleans Picayune*, and later as an editor in St. Louis. He was the father of Kate Field, the actress and lecturer of the present day. He published *The Drama in Pokerville*.

FIELD, KATE, b. St. Louis, daughter of Joseph M. She was educated in Massachusetts and in England, and at an early age became known as a correspondent for American newspapers and a writer for magazines. In 1874, she appeared on the stage in New York as "Peg Woffington," but with indifferent success. She was more successful as a lecturer. Recently she has passed most of her time abroad, where she has been received with much honor; but in 1880 is endeavoring to establish in New York a co-operative system for ladies in the purchase of dress goods. She is a facile and interesting writer.

FIELD, STEPHEN JOHNSON, b. Haddam, Conn., 1816; brother of David Dudley. At the age of 13 he made a voyage to the east in company with a brother-in-law, who was a missionary, and he spent three years in Smyrna and Athens, studying Greek and other languages. Returning to this country, he graduated at Williams college, in 1837, with the highest honors. He then studied law in the office of his brother in New York, and, after his admission to the bar, became his partner until 1848, when he went abroad and passed a year in Europe. On his return, in 1849, he joined in the emigration then just beginning to California, settled at a place where now stands the city of Marysville, and was elected the first alcalde, holding the office until the organization of the judiciary under the constitution of the state. Under Mexican law an alcalde had a very limited jurisdiction; but after the American occupation the jurisdiction exercised by him

in the anomalous condition of society in California at that time was practically unlimited. In 1850, he was elected to the legislature, and was placed on the judiciary committee. He drew up a bill defining the powers of the courts of justice and judicial officers of the state, which was passed, and most of its provisions are still retained in the code. He secured also the passage of a law giving effect to the usages and regulations adopted by the miners for the protection and working of the mines. The principle embodied in this law was adopted in other mining regions of the country, and finally by the congress of the United States. In 1857, he was elected judge of the supreme court of California, and in 1859 he succeeded David S. Terry as chief-justice. When Mr. Field came to the bench, the titles to lands in the state were unsettled, and it is principally by decisions in which he delivered the opinions of the court that the law of real property in California has been placed on a permanent basis. He was appointed in 1863, by president Lincoln, an associate justice of the supreme court of the United States, which position he still holds. The opinions of the court in the celebrated test-oath cases, written by him, and his dissenting opinion in the legal-tender cases, attracted general attention. In 1869, he was appointed professor of law in the university of California; in 1873, as one of a commission to examine the codes of the state, he prepared amendments which were adopted by the legislature. He was a member of the famous electoral commission of 1876 which decided the presidency in favor of Rutherford B. Hayes; and voted with the minority in favor of Samuel J. Tilden. His recent opinions in the Virginia jury cases, and the cases arising under the election laws of congress, have been the subject of much discussion throughout the country.

FIELD OF THE CLOTH OF GOLD, a plain near Guisnes, in the department of Calais, France, where Henry VIII. of England and Francis I. of France held a conference in June, 1520. The throne of France was sought for by Charles I. of Spain (afterwards Charles V.), and Francis sought the friendship of the English king. To bring about such a result Francis proposed to raise cardinal Wolsey to the papacy. Wolsey brought about and conducted the meeting, which was attended with so much splendor of pageantry as to give the peculiar title to the place. In the opening of *Henry VIII.* Shakespeare gives the following vivid description of the event:

- Buckingham.* An untimely ague
 Stay'd me a prisoner in my chamber when
 Those sons of glory, those two lights of men,
 Met in the vale of Andren.
- Norfolk.* Twixt Gurnes and Arde;
 I was then present, saw them salute on horseback;
 Beheld them, when they lighted, how they clung
 In their embracement, as they grew together;
 Which had they, what four throned ones could have weigh'd
 Such a compounded one?
- Buckingham.* All the whole time
 I was my chamber's prisoner.
- Norfolk.* Then you lost
 The view of earthly glory: men might say,
 Till this time pomp was single, but now married
 To one above itself. Each following day
 Became the next day's master, till the last
 Made former wonders its. To day the French,
 All clinquant, all in gold, like heathen gods,
 Shone down the English; and, to-morrow, they
 Made Britain India: every man that stood
 Show'd like a mine. Their dwarfish pages were
 As cherubims, all gilt; the madams too,
 Not used to toil, did almost sweat to bear
 The pride upon them, that their very labor
 Was to them as a painting: now this masque
 Was cried incomparable; and the ensuing night
 Made it a fool and beggar. The two kings,
 Equal in lustre, were now best, now worst,
 As presence did present them; him in eye,
 Still him in praise: and, being present both,
 'Twas said they saw but one; and no discernor
 Durst wag his tongue in censure. When these suns—
 For so they phrase 'em—by their heralds challenged
 The noble spirits to arms, they did perform
 Beyond thought's compass; that former fabulous story,
 Being now seen possible enough, got credit,
 That Bevis was believed
- Buckingham.* O, you go far.
- Norfolk.* As I belong to worship and affect
 In honour honesty, the tract of everything
 Would by a good discourser lose some life,
 Which action's self was tongue to. All was royal;
 To the disposing of it nought rebell'd,
 Order gave each thing view; the office did
 Distinctly his full function.

The solemnities occupied nearly three weeks. Ten days were spent in the fests of arms for which Wolsey had provided. There were tilting with lances, and tourneys on horseback with the broadsword, and fighting on foot at the barriers. The kings were always victorious against all comers. On midsummer day the gaudy shows were over.

FIELDS, JAMES THOMAS, b. N. H., 1817; educated in a high school in Portsmouth, and became a clerk in a book-store in Boston. In his 18th year, he read the anniversary poem before the Boston mercantile library association, on which occasion Edward Everett delivered the oration. In 1848, before the same society, he delivered another poem, *The Post of Honor*, Daniel Webster being the orator. He is widely known as a member of the successive publishing houses of Ticknor, Reed, and Fields; Ticknor and Fields; and Fields, Osgood, and Co.; for 25 years, to 1871. He collected and issued De Quincey's works in 21 volumes. In 1849, 1854, and 1858, respectively, he printed volumes of his poems for private distribution. He edited *The Atlantic Monthly* from 1862 to July, 1870; has repeatedly visited Europe, and has had wide acquaintance with literary men abroad. He has also lectured in the United States, and published *Yesterdays with Authors*, in which are many anecdotes of literary men.

FIGUERAS, ESTANISLAO, b. 1819; a Spanish statesman on the ultra liberal side at first, but afterwards a supporter of Espartero. He was a member of the Cortes (national legislature) in 1851; and was re-elected in 1862. In 1866, he was complicated in the revolutionary movements, and was imprisoned by Narvaez in 1867. After the abdication of Isabella he was a judge and a member of the revolutionary committee. Again sent to the national legislature he became a prominent leader of the republican party, and after the abdication of king Amadeo in 1873, provisional president of the republic.

FIGUEROA, FRANCISCO DE, 1540-1620; a Spanish poet, called "the divine;" educated in the university, and served in the army. He wrote the first good Spanish blank verse.

FIGUIER, GUILLAUME LOUIS, b. 1819; a French chemist and scientific writer. He commenced the study of chemistry under his uncle, was made doctor of medicine in 1841, and in the following year went to Paris to continue his studies. In 1846, he was appointed professor of the school of pharmacy in Montpellier. Afterwards, however, he returned to Paris, and in 1855, became scientific editor of *La Presse*. His contributions to scientific journals are numerous. Among the most important are: *Exposition et Histoire des principales Decouvertes Scientifiques Modernes*; *Histoire du Merveilleux dans les Temps Modernes*; and *Vies des Savants Illustres depuis l'Antiquite jusqu'au XIX Siecle*. *The Human Race*; *The Insect World*; *The World before the Deluge*, and several other popular works of this author have been translated into English.

FIGURE, GRAMMATICAL. See METONYMY, and SYNECDOCHE, *ante*.

FIGURE, RHETORICAL, an ideal characterization, or illustration, which may be affirmed by one mind and denied by another, or affirmed and denied by the same mind under different conditions. It is usually an exaltation or a depreciation of a person or thing; as "Shakespeare was divine" in appreciation; or, "Tompkins is a goose," in depreciation. In any case its expression is in metaphor. See METAPHOR.

FIGWORT, of the order *scrophulariaceae*; a flowering plant indigenous to North America and Europe; once thought valuable as a remedy for scrofula.

FILANGIERI, CARLO, 1783-1867: son of Gaetano; an officer in the French, and afterwards in the Neapolitan, army; an impetuous, rash spirit. He was concerned in many duels, in one of which he killed gen. Franceschi. Murat made him a general. He was always a supporter of absolute power, and in 1848 aided the opposition to the revolutionary movement by taking Messina after a fierce bombardment. He reduced Sicily to submission, and was made governor-general with dictatorial powers.

FILANGIERI, GAËTANO, 1752-88; an Italian writer on public polity. His *Scienza della Legislazione* appeared in 1780, and had great success. But this and earlier writings fell under the censure of the papal church, and were condemned by the congregation of the Index. His works have had much influence on European thought.

FILE FISH. See BALISTES, *ante*.

FILIGREE (*ante*). This art may be said to consist in curling, twisting, and plaiting fine pliable threads of metal, and uniting them at their points of contact with gold or silver solder and borax, by the help of the blow-pipe. Small grains or beads of the same metals are often set in the eyes of volutes on the junctions, or at intervals at which they will effectively set off the wire-work. The more delicate tracery is generally protected by framework of stouter wire. Brooches, crosses, ear-rings, and other personal ornaments of modern filigree are usually surrounded and subdivided by bands of square or flat metal, giving consistency to the filling up, which would not otherwise keep its proper shape. Probably the oldest existing jewel work is that which has been found by Belzoni, Wilkinson, Mariette, and other Egyptian discoverers in the tombs of Thebes and similar places, in which filigree forms an important feature of the ornamentation. Amongst the jewelry now in the British museum, and in the Louvre in Paris, are examples of the round plaited gold chains of fine wire, such as are still made by the filigree workers of India, and known as Trichinopoly chains. From some of these are hung smaller chains of finer wire, with minute fishes and other pendants fastened to them. Most of the rings found in these collections are whipped with gold wire soldered to the

hoop. The Greek and Etruscan filigree of about 3,000 years ago is of extraordinary fineness and perfect execution. A number of ear-rings and other personal ornaments found in central Italy are preserved in the Campana collection of the Louvre and amongst the gems of the British museum. Almost all of them are made of filigree. Some ear-rings are in the form of flowers of geometric design, bordered by one or more rims, each made up of minute volutes of gold wire, and this kind of ornament is varied by slight differences in the way of disposing the number or arrangement of the volutes. But the feathers and petals of modern Italian filigree are not seen in these ancient designs. In many ear-rings, chains hang from the upper part, and tiny birds, such as doves or peacocks, covered with enamel, are set amongst these hanging ornaments. Other Etruscan ear-rings are short tubes of gold, half or three quarters of an inch long by half an inch or less in diameter, with a plate of gold attached to the side, and the whole surface covered with filigree soldered on in minute patterns. Many rings resemble fishes with the tails in their mouths, made up of thin plates of gold and wire work of the same metal. A beautiful collection of antique examples of Greek jewelry found in the Chersonese and along the coast of Asia Minor was placed, before the Crimean war, in a museum at Kertch. Many bracelets and necklaces in that collection are made of twisted wire, some in as many as seven rows of plaiting, with clasps in the shape of heads of animals of beaten work. Others are strings of large beads of gold, with grains of gold, or with volutes and knots of wire soldered over the surface. In the British museum a scepter, probably that of a Greek priestess, is covered with plaited and netted gold wire, finished with a sort of Corinthian capital and a boss of green glass. It is probable that in India and various parts of central Asia filigree has been worked from the most remote period without any change in the designs. Whether the Asiatic jewelers were influenced by the Greeks settled on that continent, or merely trained under traditions held in common with them, it is certain that the Indian filigree workers retain the same patterns as those of the ancient Greeks, and work them in the same way, down to the present day. Wandering workmen are given so much gold, coined or rough, which is weighed, heated in a pan of charcoal, beaten into wire, and then worked in the courtyard or veranda of the employer's house, according to the designs of the artist, who weighs the complete work on restoring it, and is paid at a specified rate for his labor. Very fine grains or beads and spines of gold, scarcely thicker than a coarse hair, projecting from plates of gold are methods of ornamentation still used. This work requires the utmost delicacy of hand, and is of extraordinary richness of effect. Signor Castellani, the modern Cellini of Italy, who has made the unique filigree of the Etruscans and Greeks his special study, found it for a long time impossible to revive this particular process of delicate soldering; but the difficulty has been overcome at last. Passing to later times, we may notice in many collections of mediæval jewel work, reliquaries, covers for the gospels, etc., made either in Constantinople from the 6th to the 12th c., or in monasteries in Europe, in which Byzantine goldsmiths' work was studied and imitated. These objects, besides being enriched with precious stones, polished but not cut into facets, and with enamel, are often decorated with filigree. Large surfaces of gold are sometimes covered with scrolls of filigree soldered on; and corner pieces of the border of book covers, or the panels of reliquaries, are not unfrequently made up of complicated pieces of plaited work alternating with spaces incrustated with enamel. Byzantine filigree work occasionally has small stones set amongst the curves or knots. In the n. of Europe, the Saxons, Britons, and Celts were from an early period skillful in several kinds of goldsmiths' work. As early as the middle of the 5th c., the brooches and other personal ornaments of the "Littus Saxonium" in England were encrusted with enamel work varied with borders or centers of filigree. The Irish filigree work is more thoughtful in design and more varied in pattern than that of any period or country that could be named. It reached its highest perfection, according to Dr. Petrie, in the 10th and 11th centuries. The royal Irish academy in Dublin contains a number of reliquaries and personal jewels, of which filigree is the general and most remarkable ornament. The "Tara" brooch has been copied and imitated, and the shape and decoration of it are well known. Instead of fine curls or volutes of gold thread, the Irish filigree is varied by numerous designs, in which one thread can be traced through curious knots and complications, which, disposed over large surfaces, balance one another, but always with special varieties and arrangements difficult to trace with the eye. The long threads appear and disappear without breach of continuity, the two ends generally worked into the head and tail of a serpent or a monster. The reliquary containing the "bell of St. Patrick" is covered with knotted work in many varieties. A two-handed chalice, called the "Ardagh cup," found near Limerick a few years since, has belts, bosses at the junctions of the handles, and the whole lining of the foot ornamented with work of this kind of extraordinary fineness. The late lord Dunraven numbers forty varieties of pattern of this cup alone. Much of the mediæval jewel work all over Europe down to the 15th c., on reliquaries, crosses, crosiers, and other ecclesiastical goldsmiths' work, is set off with bosses and borders of filigree. Filigree in silver was practiced by the Moors of Spain during the middle ages with great skill, and was introduced by them and established all over the peninsula, where silver filigree jewelry of delicate and artistic design is still made in considerable quantities. The manufacture spread over the Balearic islands, and among the populations that border the Mediter-

anean, and continues all over Italy, and in Albania, the Ionian islands, and many other parts of Greece. That of the Greeks is sometimes on a large scale, with several thicknesses of wire alternating with larger and smaller bosses and beads, sometimes set with turquoises, etc., and mounted on convex plates, making rich ornamental head-pieces, belts, and breast ornaments. Filigree silver buttons of wire-work and small bosses are worn by the peasants in most of the countries that produce this kind of jewelry. Silver filigree brooches and buttons are made also in Denmark, Norway, and Sweden. Little chains and pendants are added to much of this northern work. Beautiful specimens have been contributed to the various international exhibitions. Some very curious filigree was brought from Abyssinia after the capture of Magdala—arm guards, slippers, cups, etc. They are made of thin plates of silver, over which the wire-work is soldered. Filigree is subdivided by narrow borders of simple pattern, and the intervening spaces are made up of many patterns, some with grains set at intervals. Great interest has been felt in the revival of the designs of antique jewelry by Signor Castellani. He collected examples of the peasant jewelry still made in many provinces of Italy on extraordinary designs preserved from a remote antiquity. Most of the decoration is in filigree of many varieties. It was in part through the help of workmen in remote villages, who retained the use of various kinds of solders, long forgotten elsewhere, that the fine reproductions of antique gold filigree have been so beautifully executed in Italy, and by Italian jewelers.—[From *Encyc. Brit.*, 9th ed.]

FILIOQUE, a Latin term signifying "and from the Son," designates a controversy between the Greek and Latin churches which has been prolonged through many centuries. The council of Nicea, 325 A.D., while it affirmed that the Son is of the same substance with the Father, simply added that it believed in the Holy Spirit. The council of Constantinople, 381 A.D., declared that the Spirit is of the same substance with the Father and the Son, and that he proceedeth from the Father. This is in accordance with the teaching of Christ to his apostles, and, while it does not affirm that he proceedeth from the Father *only*, certainly seems to imply it. In the Latin church the idea of the double procession seems always to have prevailed. Augustin taught clearly that the spirit proceedeth from both the Father and the Son. At the third synod of Toledo, 589 A.D., which, however, had not ecumenical authority, "filioque" was added to the creed. In the eastern church the addition was not accepted. In 809 pope Leo III. refused to sanction the addition to the creed, but approved the doctrine as scriptural and sound. In the 9th c., when the controversy arose between the patriarch of Constantinople and the pope which caused the schism between the churches, the doctrinal difference was discussed, and the western church was reproached for having departed from the faith. At length Rome did add the clause to the creed, but not publicly; no decretal or other document announced it to the church. In 1014, when Henry II. was crowned at Rome, the creed with the added clause was chanted at high mass. In 1274, at the council of Lyons, a vain attempt to reconcile the two portions of the church was made. In 1439, at the council of Florence, the effort was renewed, at first with apparent success; but the Greek church would not accept the compromise that had been agreed on. Later efforts have been equally unsuccessful. Yet the two churches both maintain the doctrine of the Trinity, while they differ only in the vain endeavor to understand and explain it. And even in this there is substantial agreement between them, for the Greek church admits the doctrine of a double procession in a sense which is in accordance with Scripture and is, probably, not essentially different from that which the Latin church maintains. In 1718, the Greek patriarch and synod made the following declaration: "We thus believe that there is a twofold procession of the Holy Spirit, the one natural, eternal, and before time, according to which the Holy Spirit proceeds from the Father alone; the other, temporal and deputative, according to which the Holy Spirit is externally sent forth, derived, proceeds, and flows from both the Father and the Son for the sanctification of the creature." Both these processions are contained in the words of Christ: "The Comforter, whom I will send unto you from the Father; even the Spirit of truth who proceedeth from the Father." At a conference of Old Catholic, Anglican, and eastern theologians, held at Bonn in 1874, there was a general agreement that the words *filioque* had been added to the creed in an illegal manner; and that peace and unity would be greatly promoted if the entire church could find a way to restore the creed to its original form, without sacrificing the doctrine held by the western churches. Thus far there has been no announcement of any progress towards the accomplishment of the desired unity.

FILMER, Sir ROBERT, an English writer of the 17th c., who upheld in the extreme degree "the divine right of kings." He assumed that the father was the ruler of the family and the king was the father of his people, and both were absolute rulers with power even to take life. It is doubtful if his opinions, which occasioned violent discussion in his day, would have been heard of in these times, if Locke had not undertaken, in his *Treatise on Government*, seriously to controvert them.

FILLMORE, a co. in s e. Minnesota, on the Iowa border, on Root river, intersected by the Southern Minnesota railroad; 864 sq. m.; pop. '80, 28,162. The surface is undulating prairie, with forests of good timber. The soil is fertile; productions, corn, wheat, oats, butter, etc. Limestone underlies much of the surface. Co. seat, Preston.

FILLMORE, a co. in s.e. Nebraska, drained by a tributary of Big Blue river; 576 sq.m.; pop. '80, 10,204. Undulating surface, and fertile soil, but not much cultivated. Co. seat, Geneva.

FILUM AQUÆ, the imaginary line along the middle of a stream which is the boundary of property on the opposing shores. Boundaries are usually specially defined, but in the absence of express terms the line between two nations, or states, or counties, or private farms, if it run along a stream, would be in the middle of such stream, and if an island should interpose the line would divide it to each party by a line corresponding to the course of the stream from the middle of the channel above to the middle of the channel below.

FINBACK. See *Rorqual*, *ante*.

FINDLAY, seat of justice of Hancock co., Ohio, 46 m. s. of Toledo, on a fork of the Auglaize river, reached by the Lake Erie and Louisville railroad; pop. '70, 3,315. It does considerable manufacturing.

FINGAL, the name of the hero in the *Poems of Ossian*, written in the last century by James Macpherson, and based on the ancient traditions of the Gaelic people of Scotland and Ireland, some of which are still known among the Celtic people of the country. The *Finn*, or *Find*, of these old stories was the *Rig*, or king of the *Fians*, or *Fenians*, of Leinster, in the time of the monarch Cormac, son of Art, and he resided at a dun, or fort, at Almhain, now the hill of Allen, in the co. of Kildare, whence comes the name of the bog of Allen, given to the great central bogs of Ireland. *Find* is said to have been killed 283 A.D., at Ath Brea on the Boyue, by a fisherman who thought to become celebrated from the act. Some Norse antiquarians say that the terms *Fingal* and *Dubgal*, used by the early Irish, mean "fair" and "dark" stranger, "gal" signifying a foreigner, or invader; and that the "fair" were the Norwegian, and the "dark" the Danish pirates who ravaged Ireland about the close of the 8th century.

FINLEY, JAMES BRADLEY, 1781-1856; b. N. C.; became a Methodist minister in Ohio in 1809, and in 1821 had charge of the Wyandotte Indian mission. He was for nearly half a century one of the most prominent preachers of his denomination, and was several times a delegate to the general conference. Among his published works are his *Autobiography*; the *Wyandotte Mission*; and *Sketches of Western Methodism*.

FINLEY, SAMUEL, D.D., 1715-66; a native of Ireland; arrived in the United States in 1734, and became a Presbyterian minister in Philadelphia in 1740. For preaching in Connecticut in violation of a law which prohibited any person from preaching in the parishes of settled ministers without their consent, he was arrested as a vagrant and put out of the colony. In 1744, he was pastor and teacher of an academy in Maryland; in 1761, president of the college of New Jersey. His sermons have been published.

FINN, HENRY J., 1788-1840; a native of cape Breton, who became a comedy actor in England, and appeared in many theaters in the United States, where he gained great popularity. He was one of the passengers lost in the burning of the steamboat *Leaington* on Long Island sound, Jan. 13, 1840.

FINNEY, CHARLES G., D.D., 1792-1875; born in Warren, Ct.; removed in childhood to Oneida co., N. Y. Having had the advantages of a common school, as a pupil until his 16th year, and as a teacher until he was 20, he then went to a high-school in New England and studied there for some time, instead of entering college as he had wished to do. At a later period still, he acquired some knowledge of Latin, Hebrew, and Greek. In 1818, he commenced the study of law at Adams, Jefferson co., N. Y. At that time he was ignorant of religion, but finding references to the Bible in his law-books, he procured one, and, beginning the examination of it in its bearings on points of law, became increasingly interested in it, and formed the habit of interpreting it as judges in court interpreted written laws. The theological views of the pastor of the church which he attended he describes as Calvinistic in a very high degree. Every position which the minister took, either in preaching or conversation, the law-student was accustomed to judge by the Bible, and to discuss with its author in very free and earnest yet friendly debate. He became deeply interested in religion, as a matter of personal importance, and was convinced that if the soul be immortal, he required a great inward change in order to be prepared for heaven. Satisfied by his own examination that the Bible is the true word of God, and brought face to face with the question whether to follow Christ or to pursue a worldly life, he did not delay his choice. Giving up the profession of law, of which he was becoming passionately fond, he determined to preach the Gospel as his life-work. His personal experience at that time was very remarkable. He received, after he believed, a baptism of the Holy Ghost which compelled him, in the abundance of his joy, to cry out when alone with God, that he could not live if the manifestation were not stayed. Beginning at once to preach in the social meetings of the church and in private conversation, he found very decided instances of conversion multiplying around him. After his licensure to preach, those revivals of religion at once began under his ministry which continued to be its great characteristic until its close. The doctrines he preached were "the voluntary total moral depravity of the unregenerate, the unalterable necessity of a radical change of heart by the Holy Ghost and by means of the truth, the divinity of the Lord Jesus

Christ, his divine mission, perfect life, vicarious death (as an atonement for the sins of all mankind), and his resurrection; repentance, faith, justification by faith, and the doctrines kindred with these. The means used were simply preaching; much prayer, public and private, as an indispensable condition of promoting the work; conference among Christians; meetings to instruct earnest inquirers, and personal conversation." It had been, he says, "the common practice to set anxious persons to praying for a new heart, and to using means for their own conversion. This had produced in them the impression that they were willing to be Christians, and were taking pains to induce God to convert them. But I tried to make them understand that God was using the means with them, and not they with him; that he was willing and they were not; that he was ready and they were not; that he required present submission to his will and present acceptance of Christ; that all delay was only an evasion of present duty; that in praying for a new heart they were trying to throw the responsibility of their conversion on God; and that their efforts to do duty while they did not give their hearts to him were hypocritical and delusive." Under this style of preaching and of earnest efforts, revivals, resulting in the hopeful conversion of thousands, were witnessed at Evan's Mills, Antwerp, Gouverneur, De Kalb, Western, Rome, Utica, Auburn, Troy, Rochester, Buffalo, in the state of New York; at Wilmington, Del.; Philadelphia, Reading, Pa.; New York, Boston, Hartford, London, Edinburgh, Oberlin, O.; and many other places during a period of 50 years. In many of the places named the revivals were repeated, in different years, again and again. In London, it was estimated that on some occasions when he preached as many as 50,000 persons left their homes to attend the services; though, of course, the building could contain but a small portion of the number. In 1835, the college and theological seminary at Oberlin, O., were founded, with Mr. Finney as professor of theology and pastor of the college church. Arthur Tappan, of New York, at that time pledged his income of \$100,000 per annum (except what was needed for the support of his own family) to the institution until it should be beyond pecuniary want. After 1860, Mr. Finney's strength being no longer equal to the extra labor abroad, he continued to work at home with great energy and success. In 1872, he resigned the pastoral office at Oberlin, but persevered in his labors in the seminary, where, having completed his last course of lectures in July, 1875, he died on a quiet Sunday in the following month, being within two weeks of 83 years of age. During 55 of these years his life had been a power in the land. His most important published works are: *Guide to the Saviour*; *Lectures to Professing Christians*; *Lectures on Revivals of Religion*; *Sermons on Important Subjects*; *Systematic Theology*; and an *Autobiography*, written at the urgent solicitation of his friends, and published after his death.

FINNISH LANGUAGE AND LITERATURE. The Finnish language is used by the people known as Finns, inhabiting Finland, or dispersed throughout Lapland, the Baltic provinces, parts of Russia proper, both banks of the middle Volga, through Perm, Vologda, West Siberia, and Hungary, and constituting the western branch of the great Urato-Altaic family. There are five groups: 1. The Finns proper; 2. The Lapps; 3. The Peruvian Finns; 4. Volga Finns; 5. Ugrian Finns. 1. The first group comprises the Suomi or Suomelaisset, i.e., Finn men, who occupy nearly all Finland except a portion on the gulf of Bothnia, where Swedish is spoken; next, the Karelians, who extend from Russian Lapland s. to the gulf of Finland and lake Ladoga, and e. to the White sea and the shores of lake Onega; thirdly, the Chudic, a Slav term often applied to the whole group, but now restricted to the Veps, or northern Chud, and the Voltic or southern Chud, dwelling in scattered communities on the shores of lake Onega; and lastly, the Baltic Finns, including the Esthe or Estonian, occupying the greater part of the southern coast of the gulf of Finland and the northern half of Livonia, and the Livonian or Krevinian, occupying a small corner in the n.w. of Courland. 2. The Lapps occupy the extreme n.w. of Russia, and some parts of northern Sweden and Norway. 3. The Permian Finns comprise the Siryenians, occupying an extensive region between 60° n. and the Arctic circle, and 50° e. and the Ural mountains, but mainly in the section of the government of Vologda; the Permian proper, formerly diffused throughout Perm, Vialka, Oufa, etc., now surviving in isolated communities mainly about the upper Kama; and the Votyak, occupying a relatively compact territory in Viatka as far n. as Glazov on the river Tchepssa. 4. The Volga Finns include the Cherreissian on the left bank of the Volga, from a little w. of Kasan to near Nijni-Novgorod; and the Nordvinian, divided into small communities on both banks of the Volga, about Simbirska, Samara, Stavropot, and Tambar. 5. The Ugrian Finns include the Voguls, extending from the Ural mountains e. to near the river Obi, and s. to Tobolsk; the Ostyaks, from the Voguls e. to the river Yenissei, between Turuchausk and Yenisseisk, and from the Arctic circle to 59° n.; and the Magyars of Hungary. These five groups form one linguistic family, to which Samoyede is related. The richest and most highly cultivated languages of the family are the Suomi and Magyar. The dialects are all distinctly agglutinative forms of speech, with decided tendencies towards true inflection, so much so that in many grammatical endings the essential difference between agglutination and inflection becomes obscured. As in other Urato-Altaic tongues, progressive vowel-harmony forms a characteristic feature of the Finnish group.

Rask considered the Finnish language the most sonorous and harmonious of tongues. It is maintained by some that the Finnish languages represent the oldest forms among the Urato-Altaic groups. There is strong evidence that the Finns, or a closely allied race, must have at one time, probably prehistoric, been spread over a considerable area of central, if not of western Europe. The Finnish language is spoken by over 2,000,000 people, and in three different dialects, viz., the East Finnish or Karelian, the South Finnish, and the West Finnish. The first of these is the oldest and least developed; the second is the main vehicle of Finnish literature. It is emphatically vocalic. It has five fundamental vowels—a, e, i, o, and u—and employs 12 diphthongs. The grammatical relations between the several parts of speech are expressed exclusively by suffixes. Nouns are used without any article; have no gender; and are declined, both in singular and plural, through 15 different cases, so as to express the relations which in the Indo-Germanic languages are sometimes indicated by prepositions. Verbs have but two tenses, present and past, the future tense being expressed by a circumlocution; but their conjugation is very intricate. The language is capable of expressing the nicest shades of meaning.

The chief monument of Finnish literature is the *Kalevala*, a sort of epic poem, which, until the present century, existed only in the memory and on the lips of the peasantry. A collection of some of the scattered parts of this poem was published in 1823 by Zacharias Topelius, but Elias Lönnrot, 13 years later, published a far more complete collection. Dr. Lönnrot wandered from place to place among the peasantry, living with them and taking down from their lips all that they knew of their popular songs. After unwearied diligence in his researches, he was successful in collecting 12,000 lines, which he arranged into 33 runes or cantos, and published exactly as he heard them sung or chanted. Continuing his researches, he published in 1849 a new edition of 22,793 verses, in 50 runes. The importance of this long-hidden epic was at once recognized in Europe, and translations of it were made in several languages. Some specimens of it were translated into English by prof. Porter, of Yale, and published in New York in 1868. The poem is written in eight-syllabled trochaic verse, and an idea of its style may be obtained from Longfellow's *Hiawatha*, which approaches a true imitation of the Finnish epic. Prof. Max Müller bears emphatic testimony to the merits of this ancient poem. "It is," he says, "equal to the *Iliad* in length and completeness; nay—if we can forget for a moment all that *we* in our youth learned to call beautiful—not less beautiful. *Kalevala* will claim its place as the fifth national epic of the world, side by side with the Ionian songs, with the *Mahābhārata*, the *Shahnamah*, and the *Nibelunge*." The *Kalevala* is concerned entirely with the mythology or folklore of the people. In the story there is a certain unity of plot, though the various parts are not perfectly homogeneous, and appear to be the product of different minds at different periods, the various songs having evidently received additions in course of time. They probably originated before the Finns were converted to Christianity, and when they were not scattered as they are now. When Dr. Lönnrot collected the *Kalevala* songs, he also gathered a considerable quantity of lyric poetry, which he published under the name of *Kanteletar*, from the name of the national instrument to which they are sung—a species of harp with five strings. Of recent Finnish poets, the most popular seems to be Paavo Korhonen, a peasant, a very sarcastic writer. Other modern poets are Marteska, Kettunen, Ilhainen, Oksaselta. The Finns abound in proverbs, Lönnrot having published a collection of upwards of 7,000, with about 200 charades, while considerable collections of legends and tales have been published. The first printed book in Finnish was probably the *Abecedarium* of Michael Agricola, bishop of Abo, which appeared in the middle of the 16th century. A translation of the New Testament by the same bishop appeared in 1548, at Stockholm. The whole Bible was not translated into Finnish till 1642. During the last and present centuries there has been considerable literary activity in Finland, and books in almost every branch of research are found in the language, mainly translations or adaptations. At the Paris international exhibition of 1878, several native Finnish painters and sculptors exhibited works which would do credit to any country. Finland is rich in periodicals of all kinds, the publications of the Finnish societies of literature and of the sciences and other learned bodies being specially valuable. Works on Finnish history and geography are quite numerous. In language we have Lönnrot's great Finnish-Swedish dictionary, recently published by the Finnish literary society.

FIORIELLI, GIUSEPPE, b. 1823; an Italian archaeologist, one of the directors, and more recently the chief superintendent, of the excavations at Pompeii. He has published maps of the old city, and a chronological history of the progress of discovery. He is also the editor of a journal containing a daily record of the work.

FIRE. Whether a tribe of men ignorant of fire and its uses has ever existed, is a question in dispute among historians and travelers. It will be enough to say that absolute proof of the existence of such a tribe has not been presented, though there are many well authenticated facts and circumstances that suggest its possibility. The uses and dangers of fire, and to a certain extent the means of controlling it, must have been generally understood at a very early age. At first it may have been simply an object of terror, but probably men soon discovered that it was a friend no less than an enemy.

Concussion or friction was undoubtedly the earliest method employed for producing fire. In the process of chipping stone, sparks were elicited, which, falling upon combustible substances, may have taught men how to produce a blaze at pleasure. The concussion of flint and steel was for ages doubtless the common method of kindling a fire, and it has not yet been entirely superseded. The Alaskans strike together two pieces of quartz, rubbed with sulphur, thereby setting the sulphur on fire, and then transfer the flame to a heap of dry grass. The Esquimaux use quartz and iron pyrites. In some countries sparks are produced by striking a piece of broken china upon bamboo; in Cochín China two pieces of bamboo are used, the silicious character of the outside layer of this wood rendering it as good as native flint. Numerous mechanical devices, for increasing by rapidity of motion the friction of different woods, were resorted to. In some cases a stick was rubbed backwards and forwards; in others it was made to rotate rapidly in a round hole in a stationary piece of wood. This method was used by the North American Indians, who improved it by applying the principle of the bow-drill. The Iroquois used the still more ingenious pump-drill. The production of fire by concentrating the rays of the sun by means of a burning-glass was well known to the ancients. North American legends narrate how the great buffalo, careering through the plains, makes sparks flit in the night, and sets the prairie ablaze by his hoofs hitting the rocks. The same idea appears in the Hindu mythology. To save the labor required in these initial processes of procuring light, and to avoid the inconvenience of carrying it about continually, primitive men hit on the expedient of a fire which should burn night and day in a public building. The Egyptians had one in every temple, the Greeks, Latins, and Persians in all towns and villages. Of these the "eternal lamps" in the Byzantine and Catholic churches may be the survival. Even the functions of the state itself, according to some eminent writers, appear to have grown out of the care bestowed on the tribal fire. The first guardians of this fire, it is said, were the earliest public servants, who by degrees appropriated all important offices, as the state itself developed into a vast aggregation of interests. The men who in the Roman empire took charge of the tribal fire were called the *prytanes*. They were fed at the public expense, and they became magistrates, in whom were combined the powers of captain, priest, and king. When Augustus usurped the authority of imperator, he assumed the powers which belonged to a board of *flamens*, or of *prytanes*. He made himself *pontifex maximus* and assumed the charge of the public fire. The Hellenic nations, as well as the Aztecs, received their ambassadors in their temples of fire, where, as at the national hearth, they feasted the foreign guests. The *prytaneion* and the state were convertible terms. If by chance the fire in the Roman temple of Vesta was extinguished, all tribunals, all public or private business had to stop immediately. No Greek or Roman army crossed the frontier without carrying an altar where the fire taken from the *prytaneion* burned night and day. Greek colonies went not forth without living coals from the altar of Hestia, to light in their new country a fire like that burning at the old home. Architecture, it is supposed, began with the creation of sacred sheds to protect the sacred fire, which was looked upon as a divinity. The fire that burned in the temple of Vesta was regarded as the very goddess herself. The hearth fire was kept holy, its flame was to remain bright and pure. According to the *Zend Avesta* nothing unclean was to be thrown into the fire, and no indecent actions are to be committed before it. To spit in one's fire would be considered in some places an unpardonable offense. Some people were so reverent that they would not blow out a light lest they should render the flame impure with their breath. In the course of time, the same reasons which led to the provision for a tribal fire induced every family to have its hearth. The family developed itself only after the married pair and their offspring had their own fire-place. This family fire was at first the privilege of only the aristocracy. The hearth was the very center of the house, as the *regia* was the sacred center of Rome and the Roman commonwealth; around the *regia* the civic and politic institutions developed themselves; and around the hearth the family grew slowly into shape and power. Let us hope it may not decline under the influence of those "modern improvements" which have superseded the hearth-stone and banished from sight the household fire. The Gentile hearth gave a recognized asylum—a right still in full vigor in some countries. The proud saying of the Englishman that his home is his castle is a remnant of this old feeling. According to the ancient belief the soul and the fire were identical. As the sun gave life to the earth, so the fire on the hearth radiated life within the house. It was the seat of the *Lares* and *Penates*, of the ancestors; a dwelling-place for the deceased; there also a stock of souls ready to enter into existence by new births was maintained. The *Vedas* taught that the hearth-fire was co-substantial with the cause of generation. Hence care was taken to preserve the purity of descent in the kin by preserving the flame of the hearth pure and unmingled with the fire taken from another house. The ancient Persians fed their fires, and especially their sacred fires, with only certain kinds of wood reputed to be cleaner than others, well dried and stripped of the bark. In all countries it was considered a fatal omen if the fire died out on the hearth. A new fire was to be lighted by the friction of two twigs, as to fetch some from a neighbor's would have been considered an adulterous union of hearths, an undue mingling of the blood of two families. The ancient naturalists supposed that the generation of fire by the friction of two woods, one of harder, the other of softer substance, was

the exact counterpart of human generation. Life was compared to a flame, to a torch, and no comparison can be more true. A torch that was put out by throwing it violently on the ground symbolized in ecclesiastical rites excommunication, or the condemnation of a soul to eternal death. Sickness being identified with sin, fire became the first and most esteemed of curative agents. The mother, after delivery, walked through fires lighted on her right hand and on her left; the infants, especially the males, were fumigated with great care. Among some populations none could approach mother and child without stepping over a brazier. Fiery ordeals heralded the attainment of the age of puberty by both sexes. Purification by fire led to the institution of baptism by fire, which in many places was thought vastly superior to baptism by water; and the idea obtained its furthest development in the notion of purgatorial fires.

Not to dwell longer on the symbolic and superstitious uses of fire, we pass to a consideration of it in its relations to the destruction by it of life and property. History is full of accounts of its ravages in all parts of the civilized world. The following list embraces the more memorable of the great fires of which records have been preserved.

GREAT BRITAIN AND IRELAND.

- 798. London; nearly destroyed.
- 982. " greater part of the city burned.
- 1086. " all houses and churches from the east to the west gate burned.
- 1212. " greater part of the city burned.
- 1666. " "The great fire," Sept. 2 to 6. It began in a wooden house in Pudding lane, and burned for three days, consuming the buildings on 436 acres, 400 streets, lanes, etc., 13,200 houses, with St. Paul's church, 86 parish churches, 6 chapels, the guildhall, the royal exchange, the custom-house, many hospitals and libraries, 52 companies' halls, and a vast number of other stately edifices, together with 3 of the city gates, 4 stone bridges, and the prisons of Newgate, the Fleet, and the Poultry and Wood street compters. The fire swept from the Tower to the Temple church, and from the n.e. gate to Holborn bridge. Six persons were killed. The total loss of property was estimated at the time to be \$53,652,500.
- 1794. " 630 houses destroyed at Wapping. Loss above \$5,000,000.
- 1834. " houses of parliament burned.
- 1861. " Tooley street wharves, etc., burned. Loss estimated at \$10,000,000.
- 1873. " Alexandra palace destroyed.
- 1137. York; totally destroyed.
- 1184. Glastonbury; town and abbey burned.
- 1507. Norwich; nearly destroyed; 718 houses burned.
- 1612. Tiverton; 600 houses burned. Loss, \$1,000,000.
- 1700. Edinburgh; "the great fire."
- 1612. Cork; greater part burned, and again in 1622.
- 1613. Dorchester; nearly destroyed. Loss, \$1,000,000.
- 1614. Stratford-on-Avon; burned.
- 1760. Portsmouth; dock-yard burned. Loss, \$2,000,000.
- 1802. Liverpool; loss, \$5,000,000.
- 1875. Glasgow; loss, \$1,500,000.

FRANCE.

- 1118. Nantes; greater part of the city destroyed.
- 1137. Dijon; burned.
- 1524. Troyes; nearly destroyed.
- 1720. Rennes; on fire from Dec. 22 to 29; 850 houses burned.
- 1784. Brest; fire and explosion in dock-yard. Loss, \$5,000,000.
- 1871. Paris; communist devastations. Property destroyed, \$160,000,000.

CENTRAL AND SOUTHERN EUROPE.

- 64. Rome; burned during 8 days; 10 of the 14 wards of the city were destroyed.
- 1106. Venice; greater part of the city was burned.
- 1577. " fire at the arsenal; greater part of the city ruined by an explosion.
- 1405. Bern was destroyed.
- 1457. Dort; cathedral and large part of the town burned.
- 1491. Dresden was destroyed.
- 1764. Königsberg; public buildings, etc., burned. Loss, \$3,000,000.
- 1769. " almost destroyed.
- 1784. Rokitzan (Bohemia) was totally destroyed. Loss, \$1,500,000.
- 1801. Brody; 1500 houses destroyed.
- 1859. " 1000 houses destroyed.
- 1803. Posen; large part of older portion of city burned.
- 1818. Salzburg was partly destroyed.

1842. Hamburg; a fire raged for 100 hours, May 5 to 7. During the fire the city was in a state of anarchy. 4,219 buildings, including 2,000 dwellings, were destroyed. One fifth of the population was made homeless, and 100 persons lost their lives. The total loss amounted to \$35,000,000. After the fire, contributions from all Germany came in to help rebuild the city.
1861. Glarus (Switzerland); 500 houses burned.

NORTHERN EUROPE.

1702. Bergen; greater part of the town destroyed.
1728. Copenhagen; nearly destroyed; 1650 houses burned, 77 streets.
1794. " royal palace with contents burned.
1795. " 50 streets, 1563 houses.
1751. Stockholm; 1000 houses destroyed.
1759. " 250 houses burned. Loss, \$2,420,000.
1775. Abo; 200 houses and 15 mills burned.
1827. " 780 houses burned, with the university.
1790. Carlserona; 1087 houses, churches, warehouses, etc., destroyed.
1858. Christiania; loss estimated at \$1,250,000.
1865. Carlstadt (Sweden); everything burned except the bishop's residence, hospital, and jail. Ten lives lost.

RUSSIA.

1736. St. Petersburg; 2,000 houses burned.
1862. " great fire. Loss, \$5,000,000.
1752. Moscow; 18,000 houses burned.
1812. " the Russians fired the city on Sept. 14, to drive out the army of Napoleon. The fire continued five days. Nine tenths of the city was destroyed. Number of houses burned, 30,800. Loss, \$150,000,000.
1753. Archangel; 900 houses burned.
1793. " 3,000 buildings and the cathedral burned.
1786. Tobolsk; nearly destroyed.
1848. Orel; large part of the town destroyed.
1850. Cracow; large part of the town burned.
1864. Novgorod; large amount of property destroyed.

TURKEY.

The following fires have occurred at Constantinople:

1729. A great fire destroyed 12,000 houses and 7,000 people.
1745. A fire lasted five days.
1750. In Jan., 10,000 houses burned; in April, property was destroyed estimated from \$5,000,000 to \$15,000,000. Later in the year, 10,000 houses were destroyed.
1751. 4,000 houses were burned.
1756. 15,000 houses and 100 people destroyed. During the years 1761, 1765, and 1767, great havoc was made by fire.
1769. July 17. A fire raged for twelve hours, extending nearly 1 m. in length. Many of the palaces, some small mosques, and nearly 650 houses were destroyed.
1771. A fire lasting 15 hours consumed 2,500 houses and shops.
1778. 2,000 houses were burned.
1782. Aug. 12. A fire burned three days: 10,000 houses, 50 mosques, and 100 corn-mills destroyed; 100 lives lost. In Feb., 600 houses burned; in June, 7,000 more.
1784. Aug. 5. A fire burned for 26 hours, and destroyed 10,000 houses, most of which had been rebuilt since 1782. In the same year, Mar. 13, a fire in the suburb of Pera destroyed two thirds of that quarter. Loss estimated at 2,000,000 florins.
1791. Between March and July, 32,000 houses are said to have been burned, and as many in 1795.
1799. In the suburb of Pera 13,000 houses were burned, and many magnificent buildings.
1816. Aug. 16. 12,000 houses and 3,000 shops in the finest quarter were destroyed.
1818. Aug. 13. A fire destroyed several thousand houses.
1826. A fire destroyed 6,000 houses.
1848. 500 houses and 2,000 shops destroyed. Loss estimated at \$15,000,000.
1865. A great fire destroyed 2,800 houses, public buildings, etc. Over 22,000 persons were left homeless.
1870. June 5. The suburb of Pera, occupied by the foreign population and native Christians, was swept by a fire which destroyed over 7,000 buildings, many of them among the best in the city, including the residences of the foreign legations. Loss estimated at nearly \$25,000,000.
1797. Sentari; the town of 3,000 houses totally destroyed.
1763. Smyrna; 2,600 houses consumed. Loss, \$1,000,000.

1772. Smyrna; 3,000 dwellings burned; 3,000 to 4,000 shops, etc., consumed. Loss, \$20,000,000.
 1796. " 4,000 shops, mosques, magazines, etc., burned.
 1841. " 12,000 houses were burned.

INDIA.

1631. Rajmahal; palace and great part of the town burned.
 1799. Manilla; vast store-houses were burned.
 1833. " 10,000 buts were burned, Mar. 26; 30,000 people rendered homeless, and 50 lives lost.
 1803. Madras; more than 1000 houses burned.
 1803. Bombay; loss by fire of \$3,000,000.

CHINA AND JAPAN.

1822. Canton was nearly destroyed by fire.
 1866. Yokohama; two thirds of the native town and one sixth of the foreign settlement destroyed.
 1872. Yeddo; a fire occurred in April during a gale of wind, destroying buildings covering a space of 6 sq. m.; 20,000 persons were made homeless.
 1873. Yeddo; a fire destroyed 10,000 houses.

UNITED STATES.

1679. Boston; all the warehouses, 80 dwellings, and the vessels in the dock-yards were consumed. Loss, \$1,000,000.
 1760. " a fire caused a loss estimated at \$500,000.
 1872. " great fire, Nov. 9 and 10. By this fire the richest quarter of Boston was destroyed. The fire commenced at the corner of Summer and Kingston streets. The area burned over was 65 acres; 776 buildings, comprising the largest granite and brick warehouses of the city, filled with merchandise, were burned. The loss was about \$75,000,000. Before the end of the year 1876, the burned district had been rebuilt more substantially than before.
 1778. Charleston; a fire caused the loss of \$500,000.
 1838. " one half of the city was burned, April 27; 1158 buildings destroyed. Loss, \$3,000,000.
 1820. Savannah; 463 buildings were burned. Loss, \$4,000,000.
 1776. New York; Sept. 21 (six days after the British took possession of the city), all the w. side, from Broadway to the North river, was burned.
 1811. " about 100 houses burned on Chatham street.
 1835. " the great fire of New York began in Merchant street, Dec. 16, and burned 530 buildings in the business part of the city; 1000 mercantile firms lost their places of business. The area burned over was 52 acres. The loss was \$15,000,000.
 1845. " a fire in the business part of the city, July 20, destroyed 300 buildings. The loss was \$7,500,000. 35 persons were killed.
 1845. Pittsburg; a large part of the city burned, April 11; 20 squares, 1100 buildings destroyed. Loss, \$10,000,000.
 1877. " riot of railway workmen. Loss over \$3,260,000. These claims were compromised at \$1,600,000. Of railroad rolling stock there were wholly destroyed and partially damaged 107 locomotives. There were wholly destroyed 33 passenger coaches, 5 Pullman palace coaches, 3 officers' coaches, 7 emigrant coaches, 3 combined baggage and passenger coaches, 1 paymaster's car, 8 baggage cars, 10 express cars, 2 postal cars, 951 box or house cars, 92 refrigerator cars, 34 stock cars, 856 gondola or flat cars, 48 cabin or freight conductors' cars, 1 tool car, 98 coal and coke cars.
 1846. Nantucket was almost destroyed.
 1848. Albany; 600 houses burned, Aug. 17. Area burned over, 37 acres, one third of the city. Loss, \$3,000,000.
 1849. St. Louis; 23 steamboats at the wharves, and the whole or part of 15 blocks of the city burned, May 17. Loss, \$3,000,000.
 1851. " more than three quarters of the city was burned, May 4; 2,500 buildings. Loss, \$11,000,000.
 1851. " 500 buildings burned. Loss, \$3,000,000.
 1850. Philadelphia; 400 buildings burned, July 9; 30 lives lost. Loss, \$1,000,000.
 1851. San Francisco; on May 4 and 5, a fire destroyed 2,500 buildings. A number of lives lost. More than three fourths of the city destroyed. Loss upwards of \$10,000,000. In June another fire burned 500 buildings. Loss estimated at \$3,000,000.
 1866. Chicago; two fires, on Aug. 10 and Nov. 18. Loss, \$500,000 each.

1871. Chicago; the greatest fire of modern times. It began on the night of the 8th of Oct., and raged until the 10th. The area burned over was 2,124 acres, or $3\frac{1}{2}$ sq.m., of the heart of the city; 250 lives were lost, 98,500 persons were made homeless, and 17,430 buildings were consumed. The buildings were one third in number and one half in value of the buildings of the city. Before the end of 1875, the whole burned district had been rebuilt. The loss was estimated at \$195,000,000.
1862. Troy (N. Y.) was nearly destroyed by fire.
1866. Portland; great fire on July 4. One half of the city was burned; 200 acres were ravaged; 50 buildings were blown up to stop the progress of the fire. Loss, \$10,000,000 to \$11,250,000.
1871. October; large forest fires in Wisconsin and Michigan; 15,000 persons were made homeless; 1000 lives lost. Loss estimated at \$3,000,000.

BRITISH NORTH AMERICA.

1815. Quebec was injured to the extent of \$1,300,000.
1845. " 1650 houses were burned, May 28. One third of the population made homeless. Loss from \$2,000,000 to \$3,750,000. Another fire, on June 28, consumed 1300 dwellings; 6,000 persons were made homeless; 30 streets destroyed. Insurance losses, \$303,850.
1866. " 2,500 houses and 17 churches in French quarter burned.
1825. New Brunswick; a tract of 4,000,000 acres, more than 100 m. in length, was burned over; it included many towns; 160 persons killed, and 875 head of cattle; 590 buildings burned. Loss about \$300,000. Towns of Newcastle, Chatham, and Douglastown destroyed.
1827. St. John (New Brunswick); 115 houses burned, Jan. 13, and nearly all the business part of the city. Loss, \$5,000,000.
1877. " great fire on June 21. The area burned over was 200 acres; 37 streets and squares totally or in part destroyed; 10 m. of streets; 1650 dwellings; 18 lives lost. Total loss, \$12,500,000. Two fifths of the city destroyed.
1846. St. John's (Newfoundland); nearly destroyed, June 9. Two whole streets burned, upwards of 1 m. long. Loss estimated at \$5,000,000.
1850. Montreal; a fire destroyed the finest part of the city on June 7; 200 houses were burned.
1852. " a fire, July 9, rendered 10,000 people destitute. The space burned was one mile in length by half a mile in width, including 1200 houses. Loss, \$5,000,000.

SOUTH AMERICA.

1536. Cuzco was nearly consumed.
1861. Mendoza; a great fire followed an earthquake which had destroyed 10,000 people.
1862. Valparaiso was devastated by fire.
1863. Santiago; fire in the Jesuit church; 2,000 persons, mostly women and children, perished.

WEST INDIES.

1752. Pierre (Martinique) had 700 houses burned.
1782. Kingston (Jamaica) had 80 houses burned. Loss, \$2,500,000.
1795. Montego Bay (Jamaica); loss, \$2,000,000.
1805. St. Thomas; 900 warehouses consumed. Loss, \$30,000,000.
1808. Spanish Town (Trinidad) was totally destroyed. Loss estimated at \$7,500,000.
1828. Havana lost 350 houses; 2,000 persons reduced to poverty.
1843. Port Republican (Hayti); nearly one third of the town was burned.

The causes of the conflagrations above recorded, and the reasons why many of them were so extensive, are not far to seek. Wooden buildings crowded together upon narrow streets and filled with combustible materials, radical faults of construction, an insufficient supply of water, the lack of proper engines and other appliances, and the want of organization, are sufficient to account for such calamities. When, however, a conflagration has passed certain limits, there appear to be no agencies of human forethought or application which can control it. The Chicago fire, driven by a gale which was almost a hurricane, raged for a day through wide streets, consuming buildings of the best material, erected with the greatest care, in the most substantial manner. The wind carried great masses of burning brands skirmishing far in advance of the grand army of destruction, and constantly starting new fires, which the combined fire-brigades of the chief cities of the land could not have prevented or extinguished. It should be remembered, moreover, that these and other similar tables record only a small proportion of the losses by fire. The great conflagrations make a strong impression upon the public, while no record whatever is made of the vast number of

smaller fires which in the aggregate are still more destructive. The value of the insured property destroyed annually by fire in the whole world has been estimated at from one hundred and twenty to two hundred millions of dollars. If we add to this the losses from the destruction of property uninsured, the figures will be startling indeed. The property slowly accumulated by the labor of thousands and tens of thousands of men may, for want of care, perish in a night, and the loss to the community would in no way be alleviated if the whole were insured. The question how fires may be most effectually prevented, and, when they occur, how they may be most surely and rapidly extinguished, is of the highest importance to mankind; and some light may be thrown upon the subject by considering the actual causes or occasions of fires, so far as they are known. The following abstract of the results deduced from about 30,000 fires occurring in London within a period of 33 years (1833-65), is of general interest. The percentages of causes were: candles, 11.07; children playing, 1.59; defective flues, 7.80; friction matches, 1.41; smoking tobacco, 1.40; sparks of fire, 4.47; spontaneous ignition, 0.95; stoves, 1.67; other known causes, 19.40; unknown causes, 32.88. Incendiarism would doubtless be found upon inquiry to account for a large proportion of the fires whose causes are here marked "unknown."

The following statistics of fires occurring in the city of New York in 1876-79 are taken from the reports of the fire department:

FIRES IN THE CITY OF NEW YORK.

YEARS.	No.	Loss.	Insurance.	Uninsured loss.	Expenditure for Fire Department.
1876	1,382	\$3,851,213	\$12,667,009	\$82,188	\$1,243,386 89
1877	1,450	3,210,695	12,508,627	122,685	1,223,391 95
1878	1,655	1,833,032	14,341,072	142,702	1,240,920 26
1879	1,551	5,671,580	21,801,710	180,060	1,219,021 34
Total	6,038	\$14,616,540	\$61,318,418	\$527,585	\$4,926,720 44

CAUSES OF FIRES IN THE CITY OF NEW YORK.

YEARS.	Carelessness.	Children playing with matches and fire.	Defective flues, etc.	Escaped gas.	Fat, oil, taking fire.	Foul chimneys.	Heat from grates, etc.	Incendiarism.	Kerosene lamps.	Not ascertained.	Overheated stoves, etc.	Sparks from chimneys, etc.	Spontaneous combustion.	Window curtains, etc., from gaslights.	Other causes.	Total.
1876	371	77	44	26	20	144	24	19	94	94	45	79	25	61	260	1,882
1877	414	83	42	35	24	164	42	32	136	62	45	127	35	96	180	1,450
1878	412	112	46	26	26	191	26	28	152	131	65	127	44	77	182	1,655
1879	378	100	50	32	43	187	76	16	93	99	58	116	40	75	184	1,551
Totals	1,575	372	182	117	113	686	168	75	475	386	213	404	144	322	806	6,038
Per cent.	26.1	6.1	3.0	1.9	1.9	11.4	2.8	1.2	7.9	6.4	3.5	6.7	2.2	5.3	13.3	

The study of this table will show in what a vast proportion of cases fires are the result of preventable causes—in other words, of carelessness that ought to be avoided. The general diffusion of information such as this would no doubt diminish in some degree the number of fires, while the use of incombustible building materials would have a still more powerful effect. But so long as the present modes of building prevail, the main dependence for preventing or diminishing losses by fire must be upon efficient organization and the use of the best means and appliances for the sure and quick extinguishment of fires when once they have been kindled. In this respect there have been great improvements in the last few years, and doubtless others will be made in the future. By means of the electric fire-alarm the knowledge of the existence of a fire and of its precise location is diffused with a rapidity formerly unknown. The fire departments in our large cities and towns are so organized as to respond instantly to an alarm. Engines worked by steam-power are ready to move at once, and they are conveyed to the desired spot by horses trained to move swiftly and with almost human intelligence. The firemen are systematically and thoroughly trained, and led by men selected for their experience, energy, and courage. The best appliances that science can suggest are ever at command; above all, the supply of water is abundant. The firemen seek first to extinguish the fire and save the building in which it broke out; if that be found impossible, they direct their efforts towards its circumscription or limitation. When a building is filled with flame there is no use in trying to save it; the thing to be done is

to prevent the fire from spreading to other buildings. The use of gunpowder and other means of breaking connection with neighboring buildings is sometimes necessary.

The New York fire department is thoroughly organized. A military spirit pervades all its regulations and movements. It is under the direction of a board of three commissioners, appointed by the mayor. The active force, divided into battalions and subdivided into companies—in all about 800 men—is under the command of a chief of department, supported by an assistant and chiefs of battalion. Each engine and ladder company is provided with a house of its own where the men live and their horses and apparatus are kept. The whole force is required to be constantly on duty and in the houses, except such of the number as are on street parole or at their meals. The horses are kept in stalls facing the engine, and are loosened by an automatic electric arrangement upon the instant that an alarm is struck. The moment they hear the sound of the gong they advance without further order to their places at the pole of the engine, the harness drops at a touch from its place of suspension and is fastened upon them in a second, the men leap to their places, and the carriage is driven at high speed to its destination. The engine is at all times kept supplied with water at a boiling point from stationary engines, and a fire is lighted under the boiler the instant it leaves the house, so that when it reaches the scene of danger a full pressure of steam is provided. So quickly is all this done, that in from three to five minutes after an alarm, streams of water are usually in full play upon the fire. The city is divided into battalion districts of small area, and the signal boxes of the fire-alarm telegraph are so placed as to afford the means of giving an alarm the moment a fire is discovered. The first alarm, calls out only a small force in the neighborhood where it is needed; if additional force is required, other alarms are given. The firemen are carefully trained, and acquire a high degree of skill in the performance of their duties. In ordinary circumstances they are able to extinguish a fire before it can do much damage; it is only when it has gained great headway before discovery, or when there are obstructions preventing ready access thereto, or when the supply of water fails, that they are unable to get it under quick control. See FIRE-ENGINE. [From *Ency. Brit.*, 9th ed.]

FIRE-ALARM, apparatus, mechanical, electric, and telegraphic, used for detecting fires, or for warning the fire department that fires exist. A series of signal-boxes is distributed over a given area, each box having a distinctive number, and being connected with the central station and with alarm-bells in the several engine-houses. A signal-box contains a transmitter, consisting of a metallic wheel, provided with suitably arranged teeth; the spaces between the teeth are filled with some non-conducting substance, as ivory; a contact spring rests against the wheel, and, as the wheel is turned, touches in succession the projecting teeth, at each tooth making the circuit, and causing a signal at all receiving stations. If the arrangement should be, two teeth, a space, three teeth, a space, and two teeth, followed by a long space, one rotation of the wheel would give two signals, then three, then two, or the number 232, and this number will be repeated as often as the wheel is rotated. The wheel may be turned by a crank, or by a spring, acting so long as a detent is held away. The signal is received upon the common Morse instrument, and recorded on a strip of paper.

The automatic fire-detector is a thermometer which has a platinum wire sealed into its bulb, and a second wire inserted at the mark of a certain temperature on the scale. The wires are in a telegraphic circuit, which remains broken until the increasing temperature causes the mercury to rise in its tube, and complete the connection by contact with the second wire. A signal is instantly communicated to the central station, showing the danger and the precise building at which it exists; an indicator, usually placed near the door, further shows from which apartment the signal was made, directing the fireman to the precise place where his services are in demand. The thermometer is usually placed in the ceiling. Insurance companies make reduced rates upon buildings provided with this instrument. Other devices have employed the ignition of powder, the expansion of metallic rods, or the breaking of wires, but none are so delicate or so worthy of reliance as that described.

FIRE ARMOR, an appliance intended to facilitate escape from a burning building, or to enable a person to remain in it with safety while engaged in extinguishing a fire. It is in principle much the same as the submarine armor now in common use. Fire armors began to be used about half a century ago, but only within a few years have they been so constructed as to be practically effective. The latest invention is that of George A. Crofutt, of New York, called by him an "eye and lung protector." It is a mask for the face, which removes the noxious qualities of the air before it enters the lungs, and protects the eyes of the wearer from dust, smoke, etc., enabling him to "see as through a glass darkly" while laboring to extinguish a fire or to save life. A double shell of thin steel covered with India-rubber is held in place by an elastic band about the head. This shell is provided with eye-holes, in which are set plates of transparent mica. The India-rubber covering of the shell, falling a little below its edge, tightens itself so closely as to prevent the intrusion of smoke and dust. For the protection of the lungs, a porous curtain, suspended from the covering of the shell, falls below the chin and is drawn by a string closely around the neck of the wearer. Within the curtain and over the mouth and nostrils is placed a moist and carefully filtered sponge,

through which the wearer breathes, and which, while cooling the air, divests it of its noxious qualities. This ingenious appliance is very light, and may be fitted to its place almost as quickly as a man puts on his hat. Many experiments have proved its efficacy. The wearer is able to remain from 20 minutes to half an hour in a room filled with smoke and foul gases.

FIRE-ENGINE (*antc*), some form or combination of forcing pumps for throwing a stream of water to extinguish a fire. A fire-engine with two pumps, and worked by levers or brakes, was invented in Egypt in the 2d c. B.C. For centuries the chief device for extinguishing fires was the hand syringe or "s squirt." In England its use was discontinued for a long time, leathern buckets, ladders, and crooks taking its place; but was revived near the close of the 16th century. Specimens of the "hand-squirt" are still preserved in London as curiosities. It seems probable that a rude sort of engine was also used in London at a very early day. In Germany, huge syringes, mounted upon wheels, were in use in 1618. Paris had fire-engines of some sort at the beginning of the 18th century. In England, in 1734, engines of various construction were manufactured, the most successful of which was that invented by Newsham. Two of his machines, the first invention of the kind ever used in this country, were introduced in New York in 1731. It was more than fifty years after this that the leather valves within the cylinders were superseded by metallic valves, placed in valve-chests apart from the cylinders and the air-chamber. Rotary and semi-rotary pumps were also introduced, and are still used to some extent in London. Floating fire-engines worked by hand were used on the Thames before the close of the 18th century. In some cases the mechanism that worked the pumps was used to move the paddle-wheels. It was not until 1850 that floating fire-engines worked by steam came into use in England. An engine of this sort has done good service for years on the North and East rivers around New York. The first steam fire-engine is believed to be that made by Braithwaite in London in 1829. Ericsson built one in New York, about 1840, similar to Braithwaite's; and Latia, in Cincinnati, produced, in 1850, the first machine which was practically useful. Cincinnati was the first city in the United States to organize a steam fire department, but other large cities and towns rapidly followed the example. The steam fire-engines now in use may be classified as having reciprocating pumps without fly-wheels, reciprocating pumps with fly-wheels, and as rotary engines. The Amoskeag company (Manchester, N. H.) builds a very effective engine, which by a simple addition is self-propelling; a pole may also be attached, that the machine may be drawn by horses. The fly-wheel shaft is provided with a pulley, from which a chain connection furnishes motive power to a larger pulley in the back driving-axle. The pulley on the fly-wheel shaft may be disconnected when the engine is pumping. On the road the engine is steered by a large wheel upon an upright shaft in front of the driver's seat; a pinion on the lower end of this shaft works in a horizontal gear-wheel, controls the front axle, and guides the machine. There is a differential gear by which one of the hind wheels may travel faster than the other when going round a curve. When standing in the engine-house, steam is maintained in a self-propelling engine, at about 80 lbs.; in steam-engines drawn by horses, at about 51 lbs.; this is done by attachment to a stationary boiler in the engine-house, fuel being laid in the furnace of the engine, to be ignited when leaving the house. See FIRE.

FIRE-ENGINE TESTS, INTERNATIONAL EXPOSITION, PHILADELPHIA, 1876.

NAME.	WEIGHT IN LBS.		DIAMETER.		Stroke.	BOILER.			PRESSURE PER SQ. IN.		Diameter Nozzle.	STREAM.	
	Light.	With water.	Steam Cyl.	Water Cyl.		Diameter.	Height.	Surface.	Steam.	Water.		Vertical.	Horizontal.
Silsby.....	Lbs. 6,596	Lbs. 7,054	Inch. 13.5	Inch. 8.38	In. 40.	In. 40.	Sq. ft. 320	Lbs. 83.	Lbs. 139.6	Inch. 1.46	Feet. 174.7	Feet. 203.4	
Nichols.....	7,122	7,323	9.	6.	40.	60	251	109.7	82.1	1.47	.....	202.9
La France.....	7,061	7,355	.....	.....	40.	56	265	62.8	78.9	1.46	.....	47.7
Ronald.....	5,812	6,022	7.75	4.33	9.	32	56	67.7	64.1	1.32	.....	27.2
Clapp & Jones.....	3,310	3,505	7.	4.25	7.	28.	52	123	84.9	1.01	.....	182.4
Button.....	6,503	6,825	8.	4.63	8.	38	58	218	90.1	1.31	202.3	215.2	
Amoskeag.....	5,035	5,225	12.	8.	4.5	34.5	60	190	65.6	83.2	1.24	.....
Amoskeag.....	7,522	8,920	7.5	4.5	8.	31.8	64	175	.....	.....	.....	.....
.....	6,105	6,264	8.5	4.25	8.	30.5	61	151	.....	.....	.....	.....
Clapp & Jones.....	3,325	4,098	8	4.75	8.	32.	52	147	100.7	145.5	.96	192.3	160.4

FIRE-EXTINGUISHER (**FIRE-ANNIHILATOR**, *antc*), an apparatus for extinguishing fires by pouring upon them water surcharged with some substance of an anti-combustible nature. The substance chiefly employed for this purpose is carbonic acid gas, the conveniences for generating which, for use at the moment it is wanted, are various. The ordinary fire-extinguisher is a cylindrical vessel, holding about eight gallons; it is made to be strapped to the back, and provided with a short hose and nozzle, through which a stream of considerable force may be discharged. The cylinder is filled with water, and within are two small vessels, one containing a bicarbonate, the other a strong

acid. When the apparatus is to be used, the contents of these vessels are emptied into the water, and the carbonic acid, set free by chemical action, is taken up by the water. The pressure created by the confined gas forces out the liquid in a strong jet when the passage is opened. The gas, in coming in contact with the flames, assists in extinguishing it by excluding the atmospheric air. For subduing a fire in its first stages this contrivance is often very effective. The first apparatus of this kind ever brought into successful use was made in London in 1816. The contrivance for generating the gas was slightly different from that above described, although the principle was the same. Within the last 12 or 15 years various methods of charging the water in the cylinder have been devised. The Babcock extinguisher is filled with a solution of bicarbonate of soda, in which is suspended a vessel of acid, which is made to tilt over and discharge its contents into the solution when the stopper is withdrawn, thus freeing the carbonic acid. Use has also been made of salts in solution, which, as the water evaporates, are left incrusting the substances in combustion, thereby excluding the air, or, failing in this, giving off incombustible gases. Large cylinders filled with chemicals in the manner above described have been mounted on wheels, and, known as chemical fire-engines, have been used to some extent, but they are valuable only in the earliest stages of a fire. Various methods have been proposed for securing the automatic action of the fire-extinguisher through the increased temperature caused by fire, but they have not been very successful. An important adaptation of the fire-extinguisher has been applied to sea-going ships. A series of pipes on the upper deck communicate severally with various compartments of the hold, the coal-bunkers, the main deck, etc. The chemical agents are placed in a box, to which steam also may be admitted; when in action, the steam mingles with the carbonic acid and the two are conveyed to the place of danger, where they take the place of the air, smother, and finally extinguish the fire. The steam pipes are perforated along their sides that the distribution may be complete and positive. A system of distributing water, as in a planing mill or other factory, consists of an extended system of pipes placed near the ceiling of the different rooms and connected with a central supply, which may be a tank near the roof, or a pipe from a powerful engine. The distributing pipes are perforated with many small orifices, so small as to deliver the water in spray. If an alarm comes from a given room, the supply of water is turned to that room, which is instantly filled with spray.

FIRE INSURANCE. See **INSURANCE**, *ante*.

FIRE ISLAND AND BEACH. Fire Island, or rather "the fire islands," in the last century, consisted of three very small uninhabited islands in the Great South bay of Long island. They were but a few acres in extent, and at high tide were almost submerged. "Fire island" now means the low, sandy spit of land, about 20 m. in length, which separates the larger portion of Great South bay from the Atlantic ocean. At its western end is Fire Island inlet, near which there is a lighthouse of the first order. The beach near the w. end is a place of summer resort for considerable numbers of people. On this beach Margaret Fuller Ossoli, with her husband and child, perished by shipwreck, July 16, 1850.

FIRELESS ENGINE, a form of steam or vapor engine which is detached from the heating apparatus. Dr. Emile Lamm, of New Orleans, invented an engine in which the motive power was derived from the vapor of ammonia. The ammonia, as it escaped from the engine, was passed into a reservoir of water, in which it was absorbed; the water when heated to a temperature of about 135° F., gave up the ammonia as gas, which was returned to the engine to be used over again, and then again absorbed and returned as before. This engine was found efficient and economical for the movement of street cars. The use of ammonia was soon abandoned, steam taking its place. Water heated to 212° F. becomes vapor, if the pressure upon it be no more than the usual atmospheric 15 lbs. per sq. inch. If the pressure be greater, the water remains liquid until a higher temperature is reached, the temperature varying with the pressure according to well-known laws. If steam at a high pressure be admitted to water of low temperature and pressure in a closed vessel, the steam will be condensed in the water, but the pressure in the vessel will be increased, while the volume of the water will be enlarged by the volume of that derived from the condensed steam. The water thus becomes charged with steam condensed under high pressure, and when the pressure is relieved, a portion of the steam reverts to its condition of vapor, and may be conducted in the usual way to a cylinder and piston, where it will do its customary work. The opening of the valves gives vent to the vapor, gradually reduces the pressure, and relieves the condensed steam; so that a tank, filled with water and stored with many times its volume of uncondensed steam, will furnish motive power sufficient to move the engine and a considerable train of cars for a trip of several miles. On its return, the tank is connected with a stationary boiler from which it receives a fresh supply of steam. It will not be forgotten that the real force of the steam is due to the heat which it contains, and that if the heat be lost, by radiation or otherwise, from the tank containing the condensed steam, its potential energy is so much reduced.

In applying these principles, the mechanism is that of an ordinary locomotive minus its fire-box, having a water-tank instead of a boiler; the appliances for stopping, starting, and backing, are as usual. The tank may be about 6 ft. long, and 3 ft. in diameter,

covered thickly with felt and wood to retain its heat. Steam is taken until the gauge indicates 135 to 150 lbs., the temperature for 135 lbs. being 353°. With this accumulation of power the machine will run 5 to 7 m. before the pressure is reduced to 60. lbs. The labor and care of firing is avoided on one of these engines, but in other respects they require the same skill needed in the common locomotive. The fireless engine has been used in several large cities, but does not seem to commend itself to practical men.

FIREMAN'S RESPIRATOR, invented by Dr. Tyndall. It is a combination of his own respirator of cotton wool moistened with glycerine, and Dr. Stenhouse's charcoal respirator. With this protection a man can remain a long time in the densest smoke.

FIRE-PROOF BUILDINGS (*ante*). Many attempts have been made to construct buildings in such a manner and of such material as to make them indestructible by fire, but they have been only partially successful. It is easy to employ incombustible materials in the construction of walls, floors, stairways, doors, etc.; but it is not so easy to make them proof against disintegration from intense heat and the application of water. In the great Chicago and Boston conflagrations it was found that walls of granite, brick, and marble, which no fire could consume, crumbled into ruin under the combined influence of fire and water, and so were no barrier to the progress of the flames. The fire could hardly have made its way more rapidly or surely if all the buildings in its path had been of wood. Hard-burned bricks no doubt make the safest walls and partitions, while ceilings and floors of the same material laid in cement are as nearly indestructible by fire as anything that the ingenuity of man has invented. It was thought at first that iron buildings would be proof against fire; but the iron girders, beams, and posts, though they cannot be consumed, are so expanded and bent under the influence of heat as to be rendered useless for supports in time of a fire. No doubt a building may be so constructed that a fire in one of its rooms may destroy what is combustible therein, without going any further and without endangering the building itself; but if it is contiguous to other buildings in conflagration, its walls must be very hard and thick to resist the power of the flames, while they can hardly protect anything within that is combustible, for the fire will make its way through doors or windows, unless extraordinary precautions have been observed. Many brick walls fail to resist fire on account of defective mortar, which crumbles from heat, causing them to deflect and fall. Wood, well pugged with cement, is strongly recommended by many architects as preferable to iron for girders and beams, but unless the cement is of the best quality, it will afford little protection. In London, safety is sometimes sought in arrangements for flooding buildings with water through pipes constantly connected with a reservoir; but in many cases this would afford but slight protection. The system of pugging wood with cement for light structures is in common use in Paris. Oak timber, on account of its hardness, is chiefly used for this purpose. The framework, made in the ordinary way, is battened with oak inside and outside, the battens being only a few inches apart. The space between the two series of vertical battens is filled with burnt clay, chips of stone, or broken brick, and then the surface on each side is coated with plaster of Paris, completely filling the interstices, covering the wood, and making a hard, smooth wall, impervious to fire to a certain extent, but liable to crack and fall away under the influence of great and protracted heat. The ceilings and floors are also battened and protected in the same way. It is difficult to isolate the different stories of a building from each other on account of the openings for hoistways and stairways; but this has been effected in some cases—notably in that of the book-warehouse of Harper & Brothers in New York—by putting the stairways outside the walls. Mansard roofs have been made less dangerous by the use of iron instead of wood to support the slate. Floors now are sometimes made fire-proof by clay bedded upon a metal support. But none of these devices, nor any others thus far adopted, afford absolute protection, under all circumstances, against the invasions of fire.

FIRE PROOF SAFES AND REPOSITORIES (*ante*), receptacles for things of value, so constructed as to protect them from fire, even though the building in which they are should be utterly destroyed. Such a safe may be described as an iron strong-box, lined with some fire-resisting medium. It is claimed that the idea of such a structure originated in this country with Mr. James Conner, type-founder, of New York, somewhere about 1832, and that he carried it into effect by placing a safe lined with plaster of Paris in his office. His invention was not patented, however, neither was its value tested by fire, and it was thrown aside after a few years. In 1843, a Mr. Fitzgerald took out a patent for the same or a similar invention. Nine years before this, however, William Marr patented in England a method for constructing a fire-proof safe. In the space between the inner and outer walls of his structure, Marr placed sheets of mica pasted upon paper, and then packed the space full of either burnt clay and powdered charcoal, or powdered marble. Since 1843, both in this country and in England, the invention, in one form or another, has come into general use, and different inventors have busied themselves with improvements. Charles Chubb, of London, used baked wood-ashes for filling; Thomas Milner, of Liverpool, inclosed one, two, or more inner cases, with spaces between for some absorbent material, in which were placed vessels, pipes, or tubes filled with an alkaline solution, or any other matter evolving steam or moisture, to be discharged into the surrounding absorbent materials on

exposure to heat or fire; other English inventors filled the inner spaces with ground alum, finely sifted, and finely pulverized gypsum, mixed together, heated to liquefaction, and forming when cool a brittle substance, which was comminuted into a fine powder; later still, another English inventor used powdered alum and sawdust for filling. The material upon which we must chiefly depend for making a safe fire-proof is water, so placed that it may be liberated as steam, since nothing can burn in a safe when its filling furnishes steam at 212° F. It is also important that the supply of steam may be continued through a protracted fire—that the material may retain its water until required by heat—and that in ordinary use the safe may be free from dampness. Safes have been built to contain pipes or cans full of water, to be set free on the melting of some easily fused metal. Substances which contain water in their chemical composition are more serviceable, alum being a notable example. Among materials used for filling safes are soap-stone, alum alone or with plaster, clay, or paper pulp, gypsum with copperas, or asbestos, tiles, raw cotton, sawdust and whiting, hydraulic cement, etc. Herring's safe is filled with double sulphate of lime, the residue of soda-water manufacture. It is dry and changeless at common temperature, but gives off carbonic acid at 1000° F., the temperature of red-hot iron. Plaster of Paris and alum are also used for the water which they contain, and the filling, when heated, furnishes a compound of carbonic acid and steam.

FIRKOWITSCH, ABRAHAM, 1786–1874; born in the Crimea, of Jewish parents. He became a thorough master of the Hebrew text of the Old Testament, and of many other works, turning his attention particularly to the literature of the Caraites, a religious sect among the Jews. He was instrumental in establishing a printing press for the Caraites of the Crimea, and the reproduction of ancient manuscripts and modern books. In his search for ancient documents, he penetrated the depths of remote Asia, finding many valuable papers not before known to exist, and unintelligible even to their possessors. He was indefatigable in his work, digging over old cellars and searching the nooks of ancient houses, and brought to the imperial library at St. Petersburg 1500 MSS., nearly all of great value.

FIROZPUR, or FEROPZEPOR, a district in British India in the Lahore division of the lieutenant-governorship of the Punjab, on the river Sutlej; 2,740 sq. m.; pop. 68,549,253; Mohammedans, 245,659; Hindus, 160,487. The productions are wheat, barley, millet, cotton, tobacco, etc. The Lahore and Ludiana road is the chief route of trade. The chief town is Firozpur, on an old bank of the Sutlej; pop. '68, 20,592. The city is surrounded by a low brick wall, and the main streets are well paved. It is also an important military station.

FISCH, GEORGES, D.D., b. Switzerland, 1814; pastor at Vevay. He afterwards joined the French evangelical church and became the successor of Adolphe Monod at Lyons. In 1855, he went to Paris, and became the colleague of Edmond de Pressensé, his brother-in-law. He is a director of the evangelical society of France.

FISCHER, ERNST KUNO BERTHOLD, b. Silesia, 1824; graduated at Halle, and taught philosophy at Heidelberg. He has written a number of philosophical works containing delineations of the systems of Descartes, Spinoza, Kant, and Leibnitz. He has also written on Schiller, Shakespeare, and Bacon. Was called to the university of Jena as professor of philosophy.

FISH, HAMILTON, LL.D., b. N. Y., 1808; son of Nicholas, who was an officer of the revolutionary army. He was educated at Columbia college, graduated in 1827, and was admitted to the bar three years afterwards. In 1842, he was elected to congress, and in 1848 was chosen governor of the state of New York. In 1851, he succeeded Daniel S. Dickinson as U. S. senator, and thenceforward acted with the republican party. He was appointed secretary of state in 1869, on the resignation of E. B. Washburne, who went as minister to France, and when Grant became a second time president Fish was reappointed. To him belongs the credit of suggesting the joint high commission with Great Britain in 1871, for the settlement of various difficulties between the two countries, the result of which was embodied in the treaty of Washington, which he was mainly instrumental in forming.

FISIL, NICHOLAS, 1758–1833; b. N. Y., and educated at Princeton, N. J. He studied law, and served in the war of 1776 as aide-de-camp and brigade-major, being promoted before the close of the war to be a lieutenant-colonel. He fought at Saratoga, and commanded a corps at Monmouth; he also served in the expedition against the Indians in 1779, and with La Fayette in 1780, and in 1781 was prominent in the operations which preceded the surrender of Cornwallis. He afterwards occupied important civil offices in his native state, and was an alderman in New York city from 1806, during eleven years. He was also, in 1797, president of the New York society of the Cincinnati.

FISHBURN, WILLIAM, 1760–1819; he was on the staff of gen. Anthony Wayne at the capture of Stony Point, N. Y.; in the convention which framed the state constitution of South Carolina; afterwards a member of the legislature of that state.

FISH CULTURE. See **PISCICULTURE**, *ante*.

FISHER, ALEXANDER METCALF, 1794-1822; b. Mass.; graduated at Yale college, where he was tutor and professor of mathematics and natural philosophy, 1815-22. He lost his life by shipwreck.

FISHER, GEORGE PARK, D.D.; b. Mass., 1827; graduated at Brown university and studied theology in Yale, Andover, and in Germany. On return he was appointed professor of divinity in Yale college, and ordained pastor of the college church (Congregational). Still later he was professor of ecclesiastical history in Yale divinity school. He has published *Essays on the Supernatural Origin of Christianity with Special Reference to the Theories of Renan, Strauss, and the Tubingen School*; and *History of the Reformation*. He has extensive learning, earnest convictions, broad views, a candid and impartial judgment. These qualities, joined with an English style at once polished and strong, give him a high place among American writers.

FISHER, *Mustela pennanti*, a quadruped of the family *mustelidae*, found in Canada and the United States. The fisher is not often trapped, being very skillful in escaping. It receives its name from its fondness for fish, which it steals cunningly from traps in which it is placed as bait for the pine-marten. It is the largest of martens, being 3 ft. long, inclusive of the tail. In color it is chiefly black, often with gray or brown tints towards the head. It is a fierce nocturnal animal, living chiefly on birds and small quadrupeds. Its fur in winter is good, and is much used in Europe. The black tail was once a favorite ornament to the caps of the Polish Jews.

FISHER, WILLIAM MARK, b. Boston, 1841; a painter of *genre* pictures; studied with George Innis, and in Paris.

FISHERIES (ante). To the general view in the article *ante* we add some facts concerning American fisheries, their extent and product. The French first learned the value of the Newfoundland fisheries about the beginning of the 16th c., a value that the lapse of 400 years has in no degree diminished. As early as 1517, there were 50 vessels employed off the banks, and 60 years later, 150 vessels were in the business. Near the close of the 16th c., there began a conflict between France and England for the control of the business, which continued for more than 100 years. Treaties were made and boundaries defined at various times, and the two nations shared about equally in the advantages. The revolution of 1789 and Napoleon's wars greatly diminished the French interest in the fisheries, but after the peace of 1815 they prospered, and in recent years as many as 800 vessels and 12,000 men have been employed by the French alone. The Spaniards also worked the American fisheries for a long period in the 16th and 17th centuries, but the decline of their naval power and the sale or loss of their American possessions withdrew them from the field. English fisheries beyond their own waters began nearly a century before the discovery by Columbus. One of the first fruits of that discovery, as continued by Sebastian Cabot, was to interest Englishmen in the Newfoundland seas, because of their wealth in fish. Temporary settlements were made on the island as early as 1522; acts were passed in 1548, and later, to encourage the fishery, and at the commencement of the 17th c., there were 200 or more English vessels in the business every year. At the same time Gosnold found the codfish off the New England coast, and gave its name to Cape Cod. Thenceforward the New England coast fisheries grew into prominence. Of course at this time the "catch" of these great fleets of fishing vessels was useful only in Europe. And it is stated as a remarkable fact that the demand for fish was seriously diminished by the rapid spread of the Protestant reformation. All this time the English government jealously guarded the fisheries, which reached a high stage of prosperity about the end of the 18th century. In 1814, the value of the product was \$12,000,000. A few years later the business passed under the control of the colonial authorities, and the distinctive English fishery as a business was ended.

American fisheries began with the settlement of the country, and New England was always foremost in the business. In 1624, the Plymouth colonists sent a cargo of fish to England, followed the next year by two ships laden with fish and furs. About 1670, the Cape Cod fisheries were leased as though they had been public property, and the rents went to the founding of a free school. In 1639, the colonial legislature passed an act to encourage the fishing business, granting to the property and the persons engaged therein certain immunities. Before 1700, exports of fish were made to Italy, Portugal, and Spain of the annual value of \$400,000. About 1740, Massachusetts had 400 vessels engaged in fishing. One of the first measures of England to bring New England into obedience in the early stages of the revolution was to deprive the colonies of the right to work the Newfoundland fishery. During the seven years of the war, fishing was neglected for the more profitable business of privateering. Independence having been achieved, one of the articles in the treaty of peace of 1783 provided "that the people of the United States shall continue to enjoy unmolested the right to take fish of every kind on the grand bank and all the other banks of Newfoundland; also in the gulf of St. Lawrence, and at all other places in the sea where the inhabitants of both countries used at any time to fish; and also that the inhabitants of the United States shall have liberty to take fish of every kind on such parts of the coast of Newfoundland as British fishermen shall use, and also on the coasts, bays, and creeks of all other of his Britannic majesty's dominions in America." One of the first ungenerous acts on the part of England, after this specific agreement, was an order in council prohibiting the importa-

tion into the British West Indies of fish caught with American hooks. But the United States government answered by imposing duties on foreign-caught fish, and offering bounties for home production. It is needless to go over the many changes, disputes, and arrangements that occurred in the century gone by with regard to the rights and duties of the United States and the British colonies in this matter. They culminated in 1877, in the results arrived at by the "fisheries commission" under the treaty of Washington, sitting at Halifax. There had been no serious trouble about rights and privileges under the original treaty of peace of 1783, until 1814, when in negotiating the treaty of Ghent the English commissioners took the position that the war (of 1812) had destroyed the treaty of 1783. The American representatives directly opposed this, and insisted that the rights of fishing guaranteed in the original treaty were irrevocable and inalienable. The convention left the question open, and it was not alluded to in the Ghent treaty. The controversy was revived in 1815, and in 1818 an attempt was made to settle it by a convention which granted to citizens of the United States the right to fish in the deep sea, and to dry and cure on British coasts, as by the treaty of 1783, while they renounced all claim to fish within three marine miles of the British coasts, bays, creeks, or harbors; still retaining, however, the right to enter such coasts bays, etc., for shelter, repairing damages, and purchasing wood. This agreement did not allay the dispute, and the fishery question was embittered by the Canso and headland questions, involving, practically, the right of Americans to fish in the gulf of St. Lawrence, the bay of Fundy, and the bay of Chaleurs. This dispute, so far as it relates to the bay of Fundy, was submitted to arbitration in connection with the seizure of the *Washington*, and was decided in favor of the United States. Angry contentions continued from 1824 to 1854, when the rival claims of New England and the colonists were amicably adjusted by the reciprocity treaty. In 1866, that treaty was abrogated, and the American and Canadian interests were again placed in conflict. Canada, at the instance of the imperial government, adopted a license system, but soon tired of the trouble and expense it entailed. Matters remained in that condition until the treaty of Washington, in 1871, when an attempt was made to settle the dispute definitely. By that instrument the fisheries of both countries were thrown open reciprocally; but, inasmuch as it was asserted by England that the privileges she accorded were of greater value than those given in return, the subject was referred to a commissioner from the United States and one from Great Britain, and a third to be nominated by the emperor of Austria. After a delay of nearly six years the commission was organized, the three arbitrators being Mr. Delfosse, sir A. T. Galt, and ex-judge Kellogg of Massachusetts. Judge Foster, assisted by R. H. Dana, jr., and others, had charge of the American case. The interests of Canada were confided mainly to Mr. Doutre, an eminent lawyer of Montreal. The British case was divided into two parts—one concerning Canada, the other Newfoundland. It held, in effect, that the privilege of fishing in American waters is worthless, and claimed an award of \$12,000,000 for the use by Americans of the Canadian inshore fisheries for 12 years—the period of treaty—and \$2,280,000 for the use of the Newfoundland fisheries. The American case denied substantially these claims. The commissioners awarded Great Britain the sum of \$5,500,000, to be paid within a year.

The whale fishery, once an important business for New England, has fallen almost into discontinuance through the scarcity of whales, their oil having been replaced through the discovery and use of the vegetable and mineral oils. In 1852, there were 602 American vessels, total tonnage 208,399, engaged in whaling; at present less than 100 vessels are so employed. The mackerel fishery is important, and is followed along the coast from Chesapeake bay to Newfoundland. Menhaden or mossbunkers are caught in enormous quantities on the coasts of Long Island for the oil to be obtained from them. In the same region millions of this prolific fish are taken to manure land. Herring are found all along the coast; and in the lakes there is a similar fish known as the siscow. Halibut are caught chiefly in the north Atlantic. The value of river fisheries has of late years greatly increased under the influence of laws regulating the times for taking, and extensive operations in stocking barren or poorly furnished streams. See PISCICULTURE. Shad are always abundant in proper season in the rivers of the middle and eastern states, growing better as they come north. The great lakes furnish white fish, trout, and lake-herring. The rivers of Maine and regions further n. abound in salmon. Along the coast the city markets are supplied with black-fish, weak-fish, cod, salmon, mackerel, blue fish, eels, porgies, and many other varieties in great abundance. The oyster fisheries all along the Atlantic coast from New England to North Carolina are important in extent and value. The seal fisheries of Alaska are also among the most important of our national resources.

FISHERMAN'S RING, a ring with a seal used since the 13th c. by the popes to stamp certain documents. The impression gives a figure of St. Peter in the act of fishing.

FISHER'S ISLAND, near the Connecticut shore at the e. entrance of Long Island sound, once comprised in the territory of Suffolk co., N. Y., but in 1880, by mutual agreement, annexed to Connecticut. It is about 7 m. long, and 1 to $\frac{1}{2}$ wide, and has an area of about 4,000 acres.

FISH-HAWK, the name in America of the *pandion haliaetus*, a bird of prey belonging to the sub-family of eagles, inhabiting the temperate regions in the vicinity of rivers,

lakes, and the sea. The American fish-hawk is 2 ft. long, with an expanse of wing of 5 feet. Its powerful and long-protracted flight, and its dexterity in seizing prey, are well known. Soaring slowly at a moderate height above the water, it singles out a fish, then suddenly closing its wings, darts down, sometimes going entirely under the water. If successful it carries the fish to a tree and devours it at leisure. It is said that the hawk sometimes pounces upon a fish too heavy for it, and is kept under water until drowned. Occasionally the hawk is robbed of its prey by the stronger and more daring bald eagle.

FISHKILL, a t. and village in Dutchess co., N. Y., on the e. bank of the Hudson, opposite Newburg, 58 m. n. of New York, on the Hudson River railroad; pop. of township, '75, 13,471. The village has several manufactories, churches, schools, etc., and has steamboat connection with New York and Albany, and by ferry with the city of Newburg. It presents picturesque views of the river and the hills.

FISK, JAMES, JR., 1835-72; b. Vt.; in early life a small trader, or peddler; afterwards in a large dry-goods house in Boston, as clerk, and then as partner. In 1863, he bought the Stonington line of steamers, and started the New York and Boston line to Bristol. In 1867, he became a director in the Erie railroad, and soon rose to be almost sole manager. In 1868, he bought Pike's opera-house in New York, also an interest in opera bouffe, and was prominent in the militia as colonel of a regiment. His stock speculations were daring, sometimes enormous, and usually fortunate. His social relations, however, led him into difficulty, and he was assassinated by Edward S. Stokes, Jan. 6, 1872.

FISK, WILBUR, D. D., 1792-1838; b. Vt.; graduated at Brown university; studied law, but entered the Methodist ministry; was delegate to the general conference and presiding elder of the Vermont district. He was especially earnest in advancing education, and, with others, founded an academy at Wilbraham, Mass., of which he was the head. In 1828, he was chosen bishop of the Canada conference; the next year president of La Grange (Ala.) college, and professor in the university of Alabama. He was also the first president of Wesleyan university at Middletown, Conn. While absent in Europe in 1835-36, he was chosen bishop of the Methodist Episcopal church, but he declined the position. Among his works are: *Sermons and Lectures on Universalism*; *Reply to Pierpont on the Atonement*; *The Calvinistic Controversy*; and *Travels in Europe*.

FISKE, FIDELIA, 1816-64; b. Mass., a niece of the Rev. Pliny Fiske. In 1843, she went to Persia as a missionary of the American board among the Nestorians, and was the first principal of the seminary for women at Oroomiah. She returned 15 years later in consequence of ill-health, and died the following year, having laid the foundation of a great educational work.

FISKE, JOHN, 1744-97; b. Mass., a seaman, and commander of the *Tyrannicide*, the first war-vessel sent out by Massachusetts in the revolution. He made a number of important captures. In 1777, he was given command of the *Massachusetts*, a larger and better ship. After the war he went into commerce.

FISKE, NATHAN WELBY, 1798-1847; b. Mass.; graduated at Dartmouth, and in theology at Andover; was professor of Greek, Latin, and intellectual and moral philosophy, in Amherst college, 1824-47. He translated Eschenburg's *Classical Manual*. Some of his sermons have been published. He was the father of Helen Hunt, known in literature as "H. H."

FISKE, SAMUEL, b. Mass., 1828-64; graduated at Amherst; was tutor in Andover theological seminary; tutor in Amherst college; traveled in Europe a year; and in 1857 was settled over the Congregational church in Madison, Conn. He served in the union army as a volunteer during the war of the rebellion, and was killed at the head of his company in the battle of the Wilderness. In journalism he was known as "Mr. Dunn Browne" in letters to the *Springfield Republican*. He published also *Experiences in the Army*. He had, in rare combination, profound earnestness of spirit and firmness in principle, with great vivacity and wit, and unflinching gentleness.

FISTULA, in farriery, the name given to an abscess usually situated on the withers of a horse, and discharging pus. Sometimes it appears on the head, when it is called poll-evil.

FITCH, EBENEZER, D. D., 1756-1833; b. Conn; graduated at Yale; was tutor there; principal of the Williamstown (Mass.) school, and when it became a college, its first president. He was for 12 years pastor of the First church, Bloomfield, N. Y.

FITCH, ELEAZAR THOMPSON, D. D., 1791-1871; b. Conn.; graduated at Yale, where he was professor of divinity and preacher to the college. He was the author of several articles in theological magazines. His sermons have been published, and are known as models of convincing argument and practical instruction.

FITCH, JAMES, 1622-1702; b. England; came to New England in 1638; pastor of the First church (Congregational) in Saybrook, Conn., 1646-60, and the first settled minister in Norwich. He could preach to the Mohegan Indians in their own language. He published *First Principles of the Doctrines of Christ*.

FITCH, JOHN, 1743-98; b. Windsor, Conn. The son of a farmer, and receiving only a common-school education, he became noted for his discoveries and inventions in connection with steam navigation. When quite a lad, he made a few voyages before the mast, but became tired of that business, and devoted himself at various times to different mechanical trades. The war of the revolution breaking out, he became a sutler on the American side, and collected by his profits quite a large sum of money, which he invested in land in Virginia. In 1780, F. became deputy-surveyor for Kentucky, and a year later, while traveling, was captured by the Indians, but soon released. He next devoted himself to the production of a map of the north-western country; and the idea of employing steam in the navigation of the western rivers, on which he sailed, having occurred to him, he sought by the sale of this map to obtain the means for his experiments. Unsuccessful in this, he next turned his attention to the state legislatures, but failed to obtain an appropriation; he at last succeeded in forming a company, and with the assistance thus obtained, constructed a steam-packet, which was launched on the Delaware in 1787, and reached a speed of 3 miles an hour. F. now obtained exclusive rights of steam navigation in New Jersey, Pennsylvania, and Delaware, and in 1790 built a boat to convey passengers on the Delaware river for hire. The scheme proved unfortunate, and the company which sustained F. was dissolved. In 1793, he went to France with the hope of introducing his invention, but failed, and returned to America disheartened and impoverished. In the mean time his Virginia lands had fallen a prey to "squatters," and heart-broken by his failures and disappointments, he committed suicide. Six years prior to his death, F. placed in charge of the Philadelphia library a sealed package, with directions that the seals should not be opened until 1823. When opened, it was found to be indorsed (inside), "To my children, and to future generations," and to contain a full record of the writer's inventions, adventures, and disappointments.

FITCH, RALPH, one of the earliest English travelers who visited India. He was a merchant in London in the latter half of the 16th c., and who undertook to improve his trading facilities by personally visiting the countries with which he was chiefly concerned. He accordingly sailed with four other merchants in Jan., 1583, in the *Tygre*, for Tripoli, in Syria, whence the party journeyed to Bagdad, and by the Tigris river to Bussorah; thence down the Persian gulf, landing at Goa, and penetrating the interior of India. F. afterwards visited Cochin and Ceylon alone, and returned to England in 1591. The account of his journey was included in Pinkerton's collection of travels, under the title: *The Voyage of Mr. Rudolph Fitch, Merchant of London, to Ormus and so to Goa, in the East Indies; to Cambai, Ganges, Bengala; to Pegu, to Samahay in the Kingdom of Siam, and back to Pegu; and from thence to Malacca, Zedon, Cochin, and all the Coast of the East Indies.*

FITCHBURG, a thriving city, one of the capitals of Worcester co., Mass., on a branch of the Nashua river, 40 m. w.n.w. of Boston. It includes the villages of Crockerville, Rockville, South Fitchburg, Traskville, and West Fitchburg. It is the terminus of four railways—to Boston, Worcester, Brattleboro, and Keene and Bellows Falls. The principal buildings are the masonic hall, the city hall, the jail, the courthouse, and the high-school. It has woolen, cotton, and paper mills, machine-shops, chair-manufactories, iron-foundries, and brass-foundries. Fitchburg was originally included in Lunenburg. It was incorporated as a separate town in 1764, and became a city in 1872. The population in 1860 was 7,805, and in 1870 it amounted to 11,260.

FITZGERALD, AUGUSTUS FREDERICK, Duke of Leinster, 1791-1874; succeeded his father in 1804, and entered the house of lords; became lord lieutenant of county Clare, and member of the queen's privy council. He was for many years the only duke in Ireland, and was for a long time grand master of freemasons. The Fitzgeralds are among the most ancient families of Ireland.

FITZGERALD, EDWARD, Lord, 1763-98; one of the leaders of the united Irishmen, a younger son of the first duke of Leinster; born near Dublin. At 10 years of age, he lost his father, and, his mother marrying again, the family soon after settled in France. Lord Edward was carefully educated by his step-father, Mr. Ogilvie, chiefly with a view to the profession of a soldier. Returning to England in 1779, he entered the English army, and in 1781 he sailed with his regiment for America, where he soon obtained the appointment of aide-de-camp on the staff of lord Rawdon. He served in the war with no little reputation for personal courage, readiness of resource, and humane feeling. He was severely wounded at the battle of Eutaw Springs. After the surrender at Yorktown, he joined the staff of gen. O'Hara at St. Lucia, and the same year returned to Ireland. He was returned as member for Athy to the Irish parliament; but the high hopes which he had cherished for serving his country faded away at the spectacle of political corruption and suppression of all genuine representation by the penal law against Roman Catholics. In 1787, he set out for a visit to the s. of Europe, went afterwards to America, and in 1790 returned to England, and resumed his seat in the Irish parliament. The French revolution had broken out, and he was one of those ardent spirits that welcomed with enthusiasm the promise of its first days. In 1792, he was attracted to Paris, and made the acquaintance of the most famous leaders of the revolution. Having publicly renounced his title of nobility

and avowed his sympathy with the republicans, he was dismissed, with other officers, from the English army. It was during his visit to Paris that he was introduced to the lady then known as "Pamela," the daughter of Madame de Genlis, by the duke of Orleans. In 1792, they were married at Tournay, and returned to Ireland in 1793. After a period of singular happiness spent in a country home, his sympathies with the struggles of his countrymen led him out to the troubled arena of politics. He joined in 1796 the united Irishmen, and was sent to France to negotiate a treaty with the directory for a French invasion of Ireland, and to urge on with the utmost zeal the preparation for an Irish insurrection. But the scheme was betrayed, several of the leaders were arrested, and Fitzgerald concealed himself in a house in Dublin, still continuing to direct the movement. A price was set on his head, the place of his retreat was discovered, and, after a severe struggle, he was captured by police officers and committed to prison. There he died of the wounds which he had received; a bill of attainder was passed against him, and his estates were confiscated; but the attainder was at a later time reversed. His widow married Mr. Pitcairn, American consul at Hamburg; but the union was an unhappy one, and ended in a separation by mutual consent. Lady Fitzgerald henceforward lived in retirement at Montauban till 1830, when she removed to Paris—Louis Philippe, the associate of her childhood, having become king of the French. He, however, refused to see her, and she died in poverty in 1831. [Compiled from *Ency. Brit.*, 9th ed.]

FITZGERALD, THOMAS, Lord, d. 1536, was vice-deputy of Ireland for his father, Gerald, ninth earl of Kildare, in the reign of Henry VIII. He appears to have accompanied his father to London early in 1534, on occasion of the third summons of the earl to answer grave charges of maladministration as lord deputy. But after the earl's committal to the Tower, he was sent back to Ireland, to take the place of vice-deputy in his father's absence, with secret instructions to raise a rebellion against the English government. He was at this time hardly of age, and his amiable manners and accomplishments had procured for him the appellation of "silken Thomas." He was, however, of a high spirit and fiery temper, and fiercely resented the English rule. As soon as he arrived in Ireland, he cleared the way by formally surrendering his office and the sword of state, and then openly proclaimed a rebellion. He obtained possession of Dublin city before the end of July, and besieged the castle, into which the English governor had withdrawn. Archbishop Allen, the primate who had been appointed by Henry VIII. to keep watch over Kildare and to report his proceedings, sought safety in flight, and sailed for England. But the ship was run aground, and the archbishop was seized by the young lord Thomas and massacred in his presence with his English chaplains and attendants. This murder was reported by a special messenger from Fitzgerald to the pope and the emperor, the former being asked for absolution if necessary, and the latter for assistance. Sentence of excommunication was pronounced on Fitzgerald for this murder of the archbishop. In Aug., he was forced to relinquish the siege of Dublin castle and hasten to defend or recover his own domains, which the earl of Ormond had invaded. He tried in vain to seduce Ormond from his allegiance, but obtained a truce, of which he took treacherous advantage to attack him. He then again besieged Dublin, which had closed its gates against him. In Oct., in consequence of Ormond's renewed invasion of Kildare, he was compelled to raise the siege. Three days later the English army landed at Dublin, and was enthusiastically welcomed. Fitzgerald withdrew into the country; but taking advantage of the inactivity of Skeffington, the new deputy, he again approached Dublin, and burnt two villages near the city. The old earl had been attainted, and he died in the tower soon after hearing of his son's rebellion and excommunication. The death-blow to the rebellion was at length given by Skeffington, who, in Mar., 1535, stormed the castle of Maynooth, the chief stronghold of the "Geraldines." Lord Thomas, who had now succeeded his father, but did not assume the title, retreated into Thomond, intending to sail for Spain and plead with the emperor. This scheme was relinquished, and after leading a wandering life for some months, with a price set upon his head, he surrendered without definite conditions to lord Leonard Grey, and was at once conducted by him to England. He was committed to the Tower with his five uncles; and the six Geraldines were hung at Tyburn as traitors, Feb. 3, 1536. An act of attainder was passed against the earl of Kildare, lord Thomas, and others, in 1537; but the family estates were restored by Edward VI., and the attainder was repealed by queen Elizabeth. [Compiled from *Ency. Brit.*, 9th ed.]

FITZHERBERT, MARIA, 1756–1837; wife of George IV. of England, daughter of Waller Smythe; widow, first of Edward Weld, and secondly of Thomas Fitzherbert. The prince of Wales (subsequently George IV.) saw her first in 1785, and married her in Dec. of that year. This union was by the law of England illegal, as it is forbidden a prince of the blood-royal to marry a subject. After the quarrel with his lawful wife (queen Caroline), George returned to Mrs. Fitzherbert, but because of his excesses, she was unable to live with him. She retired on a pension from the government.

FITZROY, ROBERT, 1805–65; b. England; went into the navy in 1819, and became vice-admiral in 1863. In 1828, he was in company with Darwin, the naturalist, in an expedition to South America. Subsequently he was a member of parliament, and in

1843 governor of New Zealand. In 1854, he became superintendent of the meteorological department of the board of trade, and in 1862 established a system of storm-warnings. With capt. King he wrote *Narrative of the Surveying Voyages of H.M.S. Adventurer and Beagle*. He published a *Barometer Manual, and Weather-Book*.

FITZSIMMONS, THOMAS, 1741-1811; b. Ireland; was a merchant in Philadelphia, and commanded a company in the revolution. He was in the state assembly and the continental congress, and from 1789 to 1795 in the federal congress. He was prominent as a leader in financial and trade matters in Philadelphia.

FIVE FORKS, BATTLE OF, April 1, 1865, in Dinwiddie co., Va., a little s.w. of Petersburg; one of the closing conflicts of the expiring rebellion. Lee, the confederate commander, was at Petersburg, and had taken possession of the "five forks" in order to protect the Southside railroad and thereby his connections with Richmond. Sheridan with a union force made an unsuccessful effort (Mar. 30, 31) to capture the position. On April 1, he renewed the attempt with about 12,500 men. After heavy fighting from daylight until nearly dark, the confederates were completely defeated, losing more than 5,000 in prisoners alone. The whole union loss was less than 1000. A few days afterwards Lee's surrender ended the war of the rebellion.

FIVE HUNDRED, COUNCIL OF, established by the French constitution, Aug. 22, 1795, and unceremoniously dissolved by Napoleon, Nov. 10, 1799. It was one of two legislative bodies, the other being the "council of ancients" with 250 members.

FIVE-MILE ACT, passed by the English parliament in 1665. It forbade non-conformist ministers, who refused to take the non-resistance oath, to come within 5 m. of any corporation where they had preached since the act of oblivion (unless they were traveling), under a penalty of £40. The act was not repealed till 1689.

FLACCUS, VERRIUS, a grammarian and teacher in Rome in the time of Augustus; a freedman, who was honored by having the emperor's grandsons among his pupils. He was the author of a number of works, from which extracts were collected by Lindemann in his *Corpus Grammat. Latinorum*.

FLACIUS, MATTHIAS, 1520-75; a German theologian, one of the converts of Luther and Melancthon. He was the head of a party of extreme Lutherans at Magdeburg; was professor of the university founded at Jena in 1558, and afterwards preached in several German cities. He was one of the authors of the *Centuries of Magdeburg*, and sole author of a number of vigorous polemical works.

FLAG (*ante*). The U. S. standard is briefly noticed under American flags, but a more extended account of that and other flags is required. Naturally the regular English flag was used by the colonies in their early days, and that was commonly the cross of St. George. The Puritan spirit was shown when Endicott, the governor of Massachusetts, cut the cross from the flag because it was a Romanist emblem. The colonial flags varied in color, it being sufficient if ground and cross differed. Now and then a pine-tree was figured in the upper left-hand quarter of the cross, and one flag had only the tree for a symbol. When sir Edmund Andros was governor he established a special flag for New England, a white field with a St. George cross, and in the center "J. R., *Jacobus Rex* (James, King), surmounted by a crown. The revolution brought in all manner of devices for flags and banners, the larger portion bearing mottoes more or less defiant of the foreign government. Soon after the fight at Lexington the volunteers from Connecticut put on their flag the arms of the colony, with the legend "*Qui transtulit sustinet*" (He who brought us over will sustain us). The colonial flag of New Amsterdam (substantially the present arms of New York city) was carried by armed vessels sailing out of New York—a beaver being the principal figure, indicative of both the industry of the Dutch people and the wealth of the fur trade. The day after the battle of Bunker Hill, Putnam displayed a flag with a red ground, having on one side the Connecticut motto, and on the other the words "An Appeal to Heaven." The earliest vessels sailing under Washington's authority displayed the pine-tree flag. An early flag in the southern states was designed by col. Moultrie and displayed at Charleston in Sept., 1775. It was blue with a white crescent in the upper corner next the staff; afterwards the word "Liberty" was added. At Cambridge, Mass., Jan. 2, 1776, Washington displayed the original of the present United States flag, consisting of 13 stripes of red and white, with a St. Andrew cross in place of the stars. The rattlesnake flag was used to some extent in two forms: in one the snake was intact, and under the figure the words "Don't tread on me;" in the other form the snake was in 13 pieces, and the legend was "Join or Die;" and in some cases the snake had 13 rattles. Ten days after the declaration of independence, congress directed the style of the flag of the United States, as heretofore described, with its later modifications. By the war department the stars in the union are usually so placed as to form one large star. In the navy the stars are in straight lines, perpendicular and horizontal. The 38 states now in the union make five horizontal lines of eight stars, with two vacancies at the right-hand end of the middle rows. The union jack is a blue ground with all the stars but no stripes. During the war of the rebellion the seceding states had a number of distinct flags. Early in 1861, however, their congress decided upon what was popularly called the "Stars and Bars," which was composed of three broad horizontal bars, the two outer ones red and the middle one white, with a blue "union" contain-

ing nine stars in a circle. Some variations were afterwards made, but they need not be noticed. There are many flags which designate special or personal position or authority. Among such are royal standards, flag-officers' flags, etc. An admiral's flag is usually the flag of the country which such admiral serves, with the exception of the "union." The flag of admirals, vice-admirals, and rear-admirals of the United States is rectangular, and consists of thirteen alternate red and white stripes. The admiral hoists this at the main; the vice-admiral at the fore; the rear-admiral at the mizzen. Should there be two rear-admirals present, the junior hoists at the mizzen a flag similar to the one described, with the addition of two stars in the left-hand corner. The commodore's flag differs from that of the admiral's in form alone, being swallow-tail instead of rectangular. Should the president go afloat, the American flag is carried in the bow of his barge or hoisted at the main of the vessel on board of which he may be. In foreign countries the royal standard is displayed at ceremonies in honor of the sovereign or at which the sovereign may be present. A flag placed midway on the staff, or "half-mast," is a sign of mourning. A flag reversed or upside down indicates distress. Salutes are made by dipping the flag by hauling it down a short distance and immediately raising it several times in succession.

FLAGG, GEORGE WHITING, b. Conn., 1816; a pupil of his uncle, Washington Allston, the painter. He studied in Europe three years and resided six years in London, working for the most part on portraits. Returning to the United States, he resumed work in New Haven. Among his pictures are "Landing of the Pilgrims," "Washington Receiving his Mother's Blessing," "Landing of the Atlantic Cable," "The Scarlet Letter," "Haidee," etc.

FLAGG, JARED BRADLEY, D.D., b. Conn., 1820; brother of George Whiting. He studied and practiced painting for several years, but turned his attention to theology, and in 1854 became a deacon in the Episcopal church, and was afterwards rector in several places, among which was Grace church, Brooklyn, N. Y. Of late years he has again given attention to painting.

FLAMBARD, RANULPH, or RALPH, d. 1128. He was a Norman of humble origin, who came to England in the train of William the Conqueror. He took holy orders, was chaplain to the bishop of London, prebendary of St. Paul's, and chaplain to William II., who raised him to the highest places in the church because in his unscrupulous greediness he flattered the vices of his master. To obtain money for the king, he devised oppressive measures by which he rightly earned the hatred of the people. His extortions were so flagrant, that an attempt to kill him was made in 1099, but the conspirators quarreled, and he was spared. Then the king made him bishop of Durham, for which honor he had to pay £1000. As soon as William died, the clamors of the people sent Flambard to the Tower, the first prisoner in that afterwards celebrated fortress. In 1101, he escaped and fled to Normandy, where he instigated Robert to an invasion of England, and accompanied the duke on the venture. He was restored as bishop of Durham, and thenceforward appears to have led a more reputable life, devoting himself to forwarding important architectural works.

FLAMININUS, TITUS QUINCTIUS, 228-174 B.C.; a Roman general and statesman, the liberator of Greece. He came into public life as a tribune under Marcellus. In 199, he was made quæstor, and the next year rose to consul, in which capacity he was sent to Macedonia, where he conducted the war with Philip. Previous commanders had been dilatory and incompetent, but the new consul manifested the greatest energy and activity. In an engagement soon afterwards, he routed the Macedonians and became master of Epirus, making friends by his moderation. Step by step he won the several Grecian states, and in the spring of 197 B.C., he took the field with nearly the whole of Greece at his back. After a cavalry skirmish near Phœræ, the main armies met at Cynoscephalæ, a low range of hills so called from a fanciful resemblance to dogs' heads. It was the first time that the Macedonian phalanx and the Roman legion had met in open fight, and the day decided which nation was to be master of Greece, and perhaps of the world. It was a victory of intelligence over brute force, and, where, numbers and courage were equally matched, the superior strategy and presence of mind of the Roman general turned the scale. The left wing of the Roman army was retiring in hopeless confusion before the deep and serried ranks of the Macedonian right, led by Philip in person, when Flamininus, leaving them to their fate, boldly charged the left wing under Nicanor, which was forming on the heights. The phalanx was like a steam-hammer, irresistible if it hit its object, but moving only in one direction, and easily thrown out of gear. Before the left wing had time to form, Flamininus was upon them, and a massacre rather than a fight ensued. This defeat was turned into a general rout by a nameless tribune who collected 20 companies and charged in rear the victorious Macedonian phalanx, which in its pursuit had left the Roman right far behind; 8,000 Macedonians were killed, and 5,000 taken prisoners, while the Romans lost only 700. Macedonia was now at the mercy of Rome, and Flamininus might have dictated what terms he liked, but he showed his usual moderation and far-sightedness in disregarding the root-and-branch politics of his Ætolian allies, whose heads were turned by the part which they had taken in the victory, and contenting himself with his previous demands. Philip lost all his foreign possessions, but retained his Mace-

donian kingdom almost entire. Such a valuable bulwark against the outer world of Thracians and Celts was not lightly to be removed. Ten commissioners arrived from Rome to regulate the final terms of peace, and at the Isthmian games which were celebrated at Corinth in the spring of 196, a herald proclaimed to the assembled crowds that "the Roman people, and Titus Quinctius, their general, having conquered king Philip and the Macedonians, declare all the Greek states which had been subject to the king henceforward free and independent." A shout of joy arose so loud that it was heard by the sailors in the harbor, and in Plutarch's time the legend told how birds flying over the course had dropped down stunned by the noise. The games were forgotten, and all crowded around the proconsul eager to kiss the hands of the liberator of Greece, who was almost smothered with chaplets and garlands. This day was indeed the climax of Flaminius's career, of which even the stately triumph that two years later he obtained at Rome must have seemed but a pale reflection. His last act before returning home is characteristic of the man. Of the Achæans, who vied with one another in showering upon him honors and rewards, he asked but one personal favor—the redemption of the Italian captives who had been sold as slaves in Greece during the Hannibalic war. These to the number of 1200 were presented to him on the eve of his departure, and formed the chief ornament of his triumph. In 192, on the rupture between the Romans and Antiochus, Flaminius returned to Greece, this time as the civil representative of Rome. His personal influence and skillful diplomacy secured the wavering Achæan states, cemented the alliance with Philip, and contributed mainly to the Roman victory of Thermopylæ. In 189, he was made censor. In this office his fair name was sullied by an unseemly quarrel with Cato. Brotherly affection tempted him to shield from just punishment a dissolute and brutal ruffian. In 183, he undertook an embassy to Prusias, to induce the king of Bithynia to deliver up Hannibal. Hannibal forestalled his fate by taking poison, and his dying words justly stigmatized this pitiful victory over a defenseless and destitute old man. The only excuse for F. in this action is that it was prompted not by wanton cruelty or love of revenge—motives which were wholly alien to his character—but by restless ambition and inordinate love of glory. The history of his later years is a blank, and we learn from his biographer Plutarch only that his end was peaceful and happy. (Chiefly from *Encyc. Brit.*, 9th ed.)

FLAMINIUS, CAIUS, d. 217 B.C.; a Roman tribune, prætor, and censor, and twice consul; the constructor of the circus and the great highway bearing his name. The latter was the first road across the Apennines and connected the Tuscan and Adriatic seas. When a second time elected consul, without staying to go through the usual solemnities of installation at the capitol, or to celebrate the *feriæ Latinæ*, Flaminius hastened to Ariminum and thence to Arretium, there to be ready for an aggressive campaign against Hannibal as soon as the roads should be open. Meanwhile, Hannibal, uneasy in his winter quarters, had accomplished, with comparative ease, the passage of the Apennines, and forced his way southward across the wooded plains of the lower Arno. The consul, fearing lest the enemy should find Rome unprotected, impetuously set out in pursuit. Free to select his own ground, Hannibal chose to make his stand between Borghetto and Passignano, in the narrow defile formed by the hills of Cortona, which is closed at its entrance by the Trasimene lake. With the main body of his infantry he barred the further outlet at the hill of Torre, while the light troops and the cavalry were posted on the sides of the pass. It was early morning (June 23, according to the uncorrected calendar, but in reality on some day in April) when Flaminius reached the spot, and a thick haze covering hill and lake, altogether concealed the position and even the existence of the enemy, until the Roman army found itself completely and hopelessly surrounded in the fatal defile. In the three hours' carnage that followed, 15,000 Romans perished, and Flaminius was among the slain. From the materials which Livy and Polybius furnish, it is manifest that Flaminius was a man of ability, energy, and probity, who with the bravery of a true soldier combined many of the best qualities of a popular democratic leader. While eminent, however, as the head of a political party, and successful in carrying some pieces of useful legislation, he has little or no claim to rank among the greater statesmen of the republic. As a general, moreover, he was headstrong and self-sufficient, and he seems to have owed such victories as he achieved to personal boldness favored by good fortune rather than to any superiority of strategical skill. (Compiled from *Encyc. Brit.*, 9th ed.)

FLAMMARION, CAMILLE, b. 1842; a French astronomer. He received his education in the ecclesiastical seminary of Langres and at Paris, was a student in the imperial observatory from 1858 till 1862, when he became editor of the *Cosmos*, and was appointed scientific editor of the *Sécle* in 1865. At this period, by a series of lectures on astronomy, he obtained considerable reputation, which was subsequently increased by his giving in his adhesion to spiritualism. In 1868, he made several balloon ascents, in order to study the condition of the atmosphere at great altitudes. M. Flammarion is the author of *La Pluralité des Mondes Habités; Les Mondes Imaginaires et les Mondes Réels; Les Merveilles Célestes; Dieu dans la Nature; Histoire du Ciel; Contemplations Scientifiques; Voyages Aériens; L'Atmosphère; Histoire d'un Planète; and Les Terres du Ciel*.

FLANDRIN, JEAN HIPPOLYTE, 1809-64; a French painter, one of three brothers. AUGUSTE, the oldest, was a professor in Lyons, where he died in 1840. HIPPOLYTE.

the second, and PAUL, the youngest, studied with Ingres in Paris, who was not only their tutor, but a life-long friend. Paul is now one of the leaders of the modern landscape school of France. In 1832, Hippolyte took the grand prize at Rome, awarded for his picture of the "Recognition of Theseus by his Father." In that city he produced "St. Clair Healing the Blind," "Jesus and the Little Children," "Dante and Virgil visiting the Envious Men struck with Blindness," and "Euripides writing his Tragedies." His fame rests, however, upon his monumental decorative paintings in Parisian churches. In 1856, he was made a member of the *académie des beaux-arts*.

FLATBUSH, a t. in Kings co., N. Y., adjoining the city of Brooklyn; pop. '80, 7,634. It contains the county almshouse, nursery, hospital, and lunatic asylum, an academy, a town-hall, a free public school, four churches, and the county military parade ground which adjoins Prospect park, Brooklyn. Flatbush is connected with the Brooklyn ferries by horse and steam railroads. It is remarkable for the size and elegance of many of its old dwellings. Flatbush was the scene of the important "Battle of Long Island," Aug. 27, 1776, when the British were victorious, compelling Washington to retire above New York, and leaving that city to English occupation during the entire war.

FLATHEAD PASS, a depression in the Rocky mountains in Montana, 6,769 ft. above tide. It has long been known and used by the Shoshone, Bannock, and Flathead Indians.

FLATHEADS, signifying certain North American Indians who artificially compress the heads of their children, as the Chinese compress the feet, by various mechanical contrivances. The deformity is much like that observed in ancient Peruvian heads. The forehead is flattened, and the upper and middle parts of the face are pushed back so that the orbits are directed upwards; the head is so distorted that the top is transformed into nearly a horizontal plane, the width of the skull and the face are much increased, and the sides are unsymmetrical. The tribes addicted to this practice comprise all those in the north-western section of British America, in Oregon, and Washington territory. A newly-born infant has a pad of grass or a flat board over the forehead, often so that the child is entirely blinded, which is retained until the required shape is produced. But, according to Pickering, the victims outgrow the deformity, so that at adult age it is seldom observable. No doubt the custom originated in some connection with religious observance, for slaves are not permitted to practice it. It is somewhat remarkable, so travelers and inquirers testify, that the intellect is not at all affected by this practice; that the flat-headed tribes are perhaps rather superior in shrewdness to Indians who have normal heads. The Chinooks, along Foca sound in British Columbia, are the best known of the Flat-head tribes. It is somewhat singular that the term "flat-heads" is persistently applied to a tribe who do not use the practice at all—the Selish, residing on tributaries of Clarke's river. This small band was converted to Christianity about 1840 by father De Smet. At that time they were in a wretchedly poor condition, but he inspired them with hope, and they rapidly improved, making progress in the cultivation of the soil, and adopting the dress and to some extent the ways of white people. Of late years, however, their situation has become unfavorable. Treaties have been made with them, usually to the advantage of the "white brother," and they have been moved from place to place, have lost by wars with other tribes, and seem doomed to early extinction.

FLAVEL, JOHN, 1627-91; an English non-conformist divine, the son of "a painful and eminent minister" in Worcestershire. He was educated at Oxford, and was curate at Deptford and Dartmouth. Under the act of uniformity, he was ejected from his living, but for some time he continued to preach and administer the sacraments privately. After the fall of the Stuarts, he was minister of a non-conformist church at Dartmouth. His works were popular for a long time.

FLAVIAN I., SAINT, 320-404; Patriarch of Antioch. Though inheriting great wealth, he devoted his riches and his talents to the service of the church. He was the successor of Meletius as patriarch. During his administration, a serious sedition occurred in the streets of Antioch, 387 A.D., in which the statues of Theodosius and the empress were overturned; but Flavian's influence with the emperor prevented the punishment of the rebellious people.

FLAVIAN II., SAINT, d. 518; Patriarch of Antioch; successor of Palladius. After his death, he was enrolled among the saints of the Greek church, and also, after considerable opposition, among those of the Latin church.

FLAVIAN, SAINT, Patriarch of Constantinople, succeeding Proclus in 447. He was deposed in 449 by the council of Alexandria, and he is supposed to have died from injuries inflicted by Dioscorus, the president of the council. He is enrolled in the martyrology of the Latin church, his day being Feb. 18.

FLAX (*ante*), cultivated in the United States less for its fiber than for the oil which is produced from the seed. When the supply of cotton was cut off during the war of the rebellion, efforts were made in some quarters to substitute flax and to spin and weave it by means of the machinery employed in the manufacture of cotton fabrics; but the result of these efforts was not satisfactory, the two products requiring essentially differ-

ent treatment. The plant will grow in almost any part of the United States, but it needs a strong, rich soil, and careful manipulation at every stage of its production and manufacture. It requires a greater amount of labor than almost any other crop, and unless extreme care is exercised at every step, the value of the crop will be seriously impaired. Flax has been cultivated in this country from its earliest settlement. According to the census of 1870, the total amount of the production here was 27,138,034 lbs. Of this amount, 17,890,624 lbs. were produced in Ohio, 3,670,818 in New York, and 2,204,606 in Illinois. The total production of flax-seed in the same year was 1,730,444 bushels, and of this 631,849 were produced in Ohio. In 1872, the number of acres sown to flax in Ohio was 85,863; the production was 733,000 bushels of seed and over 24,000 lbs. of fiber. There were in 1870 in the United States 90 flax-dressing establishments, the products of which were valued at \$815,000. Of these establishments, 46 were in New York, and 27 in Ohio. The importation of raw flax into the United States in the year ending June 30, 1873, was 4,171 tons, valued at \$1,137,737. The importation of flax manufactures in the same year, chiefly from England and Scotland, amounted to \$20,428,391.

FLÉCHIER, ESPRIT, 1632-1710; a French preacher of the congregation of Christian Doctrine. In 1659, he was professor of rhetoric at Narbonne. His chief celebrity arose from his eloquence as an orator, but he was also in great favor with his contemporaries for his political compositions, among which were *Carmen Eucharisticum*, celebrating the peace of the Pyrenees; one on the birth of the dauphin; and *Circus Regius*, describing a tournament given by Louis XIV. in 1662. He also wrote *Memoires sur les Grand Jours d'Auvergne*, in which he relates, in half romantic and half historic form, the proceedings of that extraordinary court of justice. His sermons increased his reputation, which was afterwards raised to the highest pitch by his funeral orations. His discourse on the death of Mme. Montausier secured his admission to the academy at the same time with Racine. Honors were bestowed upon him until he became bishop of Nismes. There he had occasion for the daily exercise of his greater qualities—gentleness and moderation. The edict of Nantes had been repealed two years before; but the Calvinists were still very numerous at Nismes, and the sincerity of the conversion of such as had made abjuration was doubtful at best. Flécher, by his prudent conduct, in which zeal was tempered with charity, succeeded in bringing over some of them to his views, and made himself esteemed and beloved even by those who declined to change their faith. During the troubles in the Cevennes, he softened to the utmost of his power the rigor of the edicts, and showed himself so sensible to the evils of persecution, and so indulgent even to what he regarded as error, that his memory was long held in veneration amongst Protestants of that district. In the famine which succeeded the winter of 1709, he did much to alleviate the prevalent distress by assisting the poor in his diocese without regard to their religious tenets, declaring that all alike were his children.—[From *Encyc. Brit.* 9th ed.]

FLEETWOOD, CHARLES, b. 1620; son-in-law of Cromwell and lord-lieutenant of Ireland under the commonwealth. In the parliamentary forces he rose to the rank of col.; at the battle of Dunbar he was lieutenant of horse, and at the battle of Worcester the division commanded by him contributed greatly to the victory. His second wife was Bridget Cromwell, the widow of Ireton. After Cromwell's death, F. attempted to supplant his son, Richard, but before his plans were put in action the Stuarts were recalled. He died in poverty and neglect.

FLEMING, a co. in n.e. Kentucky, on Licking river, intersected by the Maysville and Lexington railroad; 400 sq.m.; pop. '70, 13,398—1536 colored. The surface is undulating and to a large extent covered with forests; soil fertile, producing cereals, tobacco, etc. Near the Licking there is a singular deposit of fulgurites of iron ore, tubular or conical masses of ore melted and condensed by lightning striking into the earth where the ore lies. Co. seat, Flemingsburg.

FLEMING, JOHN, 1785-1857; a Scotch naturalist. He was licensed as a minister, and accepted a living in Shetland, where he became interested in natural science and wrote the *Economical Mineralogy of the Zeland and Orkney Islands*. He contributed many valuable articles to the scientific magazines and encyclopædias. His first important separate work was the *Philosophy of Zoology*, in which he promulgated a system of classification differing from those of Cuvier and Linnaeus, and known as the binary system, in which animals were classed according to their positive and negative characteristics. In *History of British Animals*, he made the first attempt in Great Britain to show the paleontological history of animals with the history of animals of the present time. In 1832, he was professor of natural philosophy in Aberdeen, afterwards professor of natural science in Edinburgh. Among his works are *Molluscous Animals, including Shell Fish*; *The Temperature of the Seasons*; and *The Lithology of Edinburgh*.

FLEMISH SCHOOL OF PAINTING, established in the 15th c. by the brothers Van Eyck. It comprises many distinguished names. Among the early masters of this school were the Van Eycks, Memling, Weyden, Matsys, Mabius, and Moro. Later, we find Rubens, Vandyck, Snyder, Jordaens, Gaspar de Crayer, and the younger Teniers. In the beginning of this school, its characteristics were dignity and strength, and it

developed the mechanical advantage (under Hubert van Eyck) of improved methods of mixing pigments and varnishing. Later, it presented a physical energy almost coarse, a daring execution, and a brilliant color: still later, elegance with power in historic and dramatic depiction. See PAINTING, *ante*.

FLETCHER, BENJAMIN, colonial governor of New York from 1691 to 1698. He was persistent in endeavoring to establish the English in place of the Dutch reformed church, but was unsuccessful. Under William and Mary, he was commissioned as governor of Pennsylvania.

FLETCHER, JAMES COOLEY, b. Ind., 1823; graduated at Brown university, and studied theology at Princeton, and in Paris and Geneva. In 1851, he was in Rio Janeiro, as chaplain or missionary of the American and foreign Christian union, also as the American secretary of legation. At a later period, he traveled extensively in Brazil, and embodied his observations in *Brazil and the Brazilians*. In 1869, he was sent as consul to Oporto.

FLETCHER, JOHN WILLIAM (FLÉCHÈRE, JEAN GUILLAUME DE LA), 1729-85; b. Switzerland, educated at Geneva. He intended to be a clergyman, but so disliked extreme Calvinistic doctrines that he abandoned that purpose and went into the military service of Portugal, but afterwards took a commission in the Dutch army. Peace intervened before he had opportunity to fight, and he went to England, where he became a tutor. In 1755, he joined the Methodist society, and two years later he took orders in the church of England, and, refusing a rich parish, became vicar of Madeley, laboring with much self-sacrifice among the most debased and neglected people. For a time, he labored under the auspices of the countess of Huntington, but his Arminian views severed him from that Calvinistic connection. He was one of the founders of Methodism, working for many years with Wesley, Whitefield, and their compeers. His works have been published in New York.

FLEUR-DE-LIS. See IRIS.

FLEURY, ANDRÉ HERCULE DE, Cardinal, the celebrated minister of Louis XV. of France. He was educated at the Jesuit college in Paris, appointed almoner to the queen Maria Theresa, and by Louis XIV. made bishop of Frejus in 1698. When Louis XIV. died, the regent appointed him preceptor to Louis XV., then but five years old. On the death of the regent he took a seat in the privy council. In 1726, when he was in his 73d year, he assumed supreme power, and was created cardinal. Under his administration, France in her internal affairs was prosperous, but fell into difficulties in relations with foreign countries.

FLEURY, LOUIS DE, Chevalier and viscount of France, who joined the patriot army during the American war of the revolution, was appointed to a captaincy by Washington, rose to be lieutenant-col., and commanded a battalion of light infantry. He fought under Steuben and Lee, and having greatly distinguished himself by personal gallantry at the storming of Stony Point, he received a silver medal and the thanks of congress. After the war he returned to France in the service of count Rochambeau.

FLEXIBLE SANDSTONE, or ITACOLUMITE, a metamorphic siliceous rock of Brazil and the Alleghany region of the United States, occurring in thin and somewhat flexible (but non-elastic) layers. These layers may be bent back and forth many times without breaking.

FLIEDNER, THEODOR, D.D., 1800-64; a Christian philanthropist; b. at Eppstein, a village on the frontiers of Hesse and Nassau, where his father was pastor of the parish church. He studied at the universities of Giessen and Göttingen, and the theological seminary of Herborn; was licensed to preach at the age of 20, and the next year became pastor of the small church at Kaiserswerth, a town on the Rhine below Düsseldorf. His salary was to be 180 Prussian dollars, but even this the congregation (through the failure of the factory in which many of them were employed) soon became unable to pay. This induced him to undertake a tour to raise funds in their behalf. "Never did a man begin to ask for help with a heavier heart, nor with worse success, till a brother pastor at Elberfeldt took him home to dinner and told him that the three requisites for his work were patience, impudence, and a ready tongue. The recipe, to which F. added much prayer and faith, proved so successful that he became the most accomplished beggar known in Germany. England, America, and many distant regions learned to pour their contributions into his wallet, and often his worst necessities were relieved by what seemed almost miraculous, unsolicited gifts, which exactly answered the demands made on him." During a visit to England in 1823, he became acquainted with the benevolent work of Elizabeth Fry. Having returned home, he visited the prisons around him, and found them in a dreadful condition. The convicts were crowded together in narrow, dirty cells, and dark, damp, and close cellars; boys were mixed up with cunning old sinners, and young girls with corrupt women. There was no classification whatever; persons committed for trial, who might be proved innocent, and be discharged, were placed with criminals condemned to a long imprisonment. There was no supervision except to prevent escape. For more than two years F. tried by his personal toil alone to remedy these evils; afterwards he formed the first German society for improving prison discipline. When seeking a matron for the women's

wards at Düsseldorf he found his wife, whose parents refused to let her take that position alone, but approved her acceptance of the young pastor himself, although the second offer included all the duties of the first. In 1833, he took into a summer-house in his garden a poor discharged prisoner who wished to reform, and this act proved the beginning of his work for the reformation of convicts. A friend of his wife, coming to take charge of this small beginning, was styled a deaconess. Soon the summer-house was replaced by a larger building, the solitary deaconess obtained companions, and the establishment continued to grow. This suggested the order of deaconesses for the care of the sick poor. He bought a house without money to pay for it, but with great faith. All his enterprises began in this small way. His hospital was started with one table, some broken chairs, a few worn knives and two-pronged forks, seven sheets, and four severe cases of illness. The institution soon flourished under royal favor. In 1838, he first sent deaconesses to work in other places, and from this beginning "mother-houses" multiplied until, in 1866, there were 139. In the course of his life F. established at Kaiserswerth training colleges for school-mistresses and governesses, a lunatic asylum, a boys' school, and a training college for school-masters. All these institutions are turned to account in the training of deaconesses. Many curious incidents are related to show his personal interest in his work. In his infant schools he would throw himself down on the floor to illustrate the killing of Goliath; he distributed bread and honey to show the excellence of heavenly manna, and sent boys under the table to enliven the story of travelers falling down a precipice. His toil continued until, physically worn out, he died. To the last, he took eager interest in the details of work, persevered in earnest exhortations, and closed his life by receiving the communion with his whole establishment and family, including two sons whose reception into the church he had earnestly desired.

FLINCK, GOVERT, 1616-69; a Dutch painter, a pupil of Rembrandt, and a follower of that master's style. His first subject-picture is the "Blessing of Jacob," in the Amsterdam museum, his earliest production being a likeness of a lady, in the gallery at Brunswick. Both are thoroughly Rembrandtesque, in effect as well as in vigor of touch and warmth of flesh tints. The four "Civic Guards" and "Twelve Musketeers," with their president in an arm-chair, in the town-hall at Amsterdam, are fine specimens of composed portrait groups. But the best of Flinck's productions in this style is the "Peace of Munster," in the museum of Amsterdam, a canvas with 19 life-size figures full of animation in the faces, "radiant with Rembrandtesque color," and admirably distributed. Flinck here painted his own likeness to the left in a door-way. The mannered period of Flinck is amply illustrated in the "Marcus Curius eating Turnips before the Samnite Envoys," and "Solomon receiving Wisdom," in the palace on the dam at Amsterdam.

FLINT, a city and township, and seat of justice in Genesee co., Mich., on Flint river and Flint and Pere Marquette railroad, 64 m. n.n.w. of Detroit; pop. of city '70, 5,336. It has a court-house, city hall, high school, nearly a dozen churches, the state institution for the deaf and dumb, and a number of manufactories, especially of lumber. It has had rapid growth.

FLINT, AUSTIN, a physician; b. Mass., 1812; educated at Amherst and Harvard, graduating as M.D. at the latter in 1833. After practicing in Boston and Northampton, he removed to Buffalo, N. Y., in 1836. He was appointed professor of the institutes and practice of medicine in Rush medical college, Chicago; resigned after one year, and in 1846 established the *Buffalo Medical Journal*. With Drs. White and Hamilton he founded the Buffalo medical college in 1847, where he was professor of the principles and practice of medicine for six years. He was afterwards professor of the theory and practice of medicine in the university of Louisville, Ky., from 1852 to 1856. He was then called to the chair of pathology and clinical medicine at Buffalo. From 1858 to 1861, he was professor of clinical medicine in the school of medicine at New Orleans. In 1859, he removed to New York, and in 1861 was appointed visiting physician to Bellevue hospital, professor of the principles and practice of medicine in Bellevue hospital medical college, and of pathology and practical medicine in Long Island college hospital. He is the author of several important medical essays and books, among which are works on *Continued Fever; Chronic Pleurisy; Dysentery; Physical Exploration, and Diagnosis of Diseases affecting the Respiratory Organs; A Practical Treatise on the Pathology, Diagnosis, and Treatment of Diseases of the Heart; and a Treatise on the Principles and Practice of Medicine*.

FLINT, AUSTIN, Jr., b. Mass., 1836; a physician, son of Austin. He attended medical lectures at the university of Louisville and afterwards at Jefferson medical college, Philadelphia, where he graduated in 1857. For the following two years he was editor of *Buffalo Medical Journal*, and surgeon to Buffalo city hospital, and professor of physiology and microscopical anatomy in the university of Buffalo. In 1859, he removed to New York with his father, and was appointed professor of physiology in New York medical college. He was appointed professor of physiology in the school of medicine at New Orleans, and went to Europe in the following spring. In 1861, he became professor of physiology and microscopic anatomy in Bellevue hospital medical college, New York, in which position he remains (1880). Dr. Flint has made extensive experimental

investigations in human physiology, and has made several important discoveries. He has assisted in establishing the glycogenic function of the liver; has shown that one of the functions of the liver is to separate from the blood the cholesterine, which is a product of the nervous system, and which cholesterine, becoming a constituent of the bile, is afterwards converted into what he has named stercorine, the odorous principle of the fæces. He has also made many important observations on the functions of the nervous system. His principal works are *The Physiology of Man*, 5 vols. 8vo., and a *Treatise on Human Physiology*, 1 vol. 8vo.

FLODOARD, or **FRODOART**, 894-966; a French chronicler, and canon in Rheims. His works are the most important contributions to the French literature of the time. They consist of *Histoire de l'église à Rheims*; *Chronique sacrée* (a poetical history of Christ the apostles, popes, saints, and martyrs of the church); and the *Chronicon rerum inter Francos gestarum*, beginning with 919 and ending with 966. This last work was translated and makes a part of Guizot's historical memoirs. It throws more light than any other document on the annals of the 10th century.

FLOGGING, in the ARMY and NAVY (*ante*). This practice was long ago discontinued by the U. S. government. It may be noted, however, that under the statutes of one state (Delaware) it exists as a punishment for petty crimes.

FLOOD, **HENRY**, 1732-91; a politician and member of the Irish house of commons, where his eloquence gave him great popularity. He was privy counselor for the two kingdoms, and vice-treasurer for Ireland. He was also a member of the English house of commons, where he had a celebrated discussion with Grattan. He was the author of two or three poems of little importance.

FLOOD-PLAIN, land along a stream, little above the ordinary water-level, and often subject to overflow. The deposits made by successive floodings convert the land into a dry terrace.

FLORÉAL, the 8th month in the French republican calendar, corresponding with the last third of April and the first two thirds of May. The name signifies "flowering" or "flowering month."

FLORENCE, a province in Tuscany, Italy, bordering on Bologna; 2,263 sq.m.: pop. 72, 766,824. The Apennines traverse the e. part of the province. The Arno is the principal river. Three railroads pass through it. Agriculture is a prominent business of the people. Excellent wine is produced. There is extensive cattle breeding and olive cultivation, and some mining. Florence is the chief city and capital.

FLORENCE, a village and seat of justice in Lauderdale co., Ala., at the head of navigation on the Tennessee river, at the lower end of Muscle shoals, connected by rail with Tusculumbia and the Memphis and Charleston railroad; pop. 2,003. It has the Florence synodical college, a normal college, a seminary for girls, a number of cotton manufactories, and considerable river trade.

FLORENCE, a village in Idaho co., Idaho, about 160 m. n. of Boise city; supposed to be the highest inhabited town in the United States, being over 11,000 ft. above the sea level. The mountain on which it stands rises 2,000 ft. above it. It has profitable mines of gold.

FLORENCE, COUNCIL OF, in continuance of the council of Ferrara (which see), assembled in 1439. The proposed reunion of the eastern and western churches was the great object sought to be accomplished—the pope desiring it as a means of triumph over his adversaries in the council of Basle, which was still in session, and the emperor longing for it in order to secure the help of the west against the Turks. The discussions, commenced at Ferrara, were resumed on the four chief points of difference: 1, the addition of "filioque" to the creed; 2, the use of unleavened bread in the eucharist; 3, purgatory; 4, the papal supremacy. On the first three, compromises were effected, and the last the Greeks, in a great degree, accepted. The formal decree of union was drawn up and signed by the pope and many others on the part of the Latins, and by the emperor and many of his chief dignitaries in behalf of the Greeks. But the union, having been prompted only by political necessities and having no place in the hearts of the Greeks, was soon openly denounced and brought to nought. Many of those who had signed the decree, on their return home recanted, saying, "Alas! we have been seduced by distress, by fraud, and by the hopes and fears of a transitory life. The hand that has signed the union should be cut off, and the tongue that has pronounced the Latin creed deserves to be torn from the root." In April, 1442, the sessions of the council were transferred to Rome.

FLORENTINE WORK. See **PIETRA DURA**, *ante*.

FLORIAN, **JEAN PIERRE CLARIS DE**, 1755-94; a French poet and writer of romances. He was early introduced to Voltaire, and when 13 years old became a page of the duke of Penthièvre, who remained his patron. For a short time he was in the army, but soon returned to the quieter life of his patron's house, where he devoted himself to literary pursuits. At the outbreak of the revolution he was imprisoned. He was soon liberated, but survived his release only a few months. In 1782, he brought out an epistle in verse entitled *Voltaire et le Serf du Mont Jura*, which was crowned by

the French academy. The same honor was given the following year to *Ruth*, an eclogue. This was followed the same year by *Galatée*, an imitation of Cervantes, and two years later by *Numa Pompilius*, an imitation of Fénelon's *Telemaque*. A pastoral entitled *Estelle* is esteemed the best of his works. In 1791, he published *Gonzalve de Cordone*, a romance, and in 1792 a collection of *Fables*. He began, but did not complete, a romance founded on the story of William Tell. This occupied him during his imprisonment, when he also made an abridgment of *Don Quixote*, which was published after his death. Some of his best writings are his fables, comedies, and minor tales. In 1788, he was made a member of the French academy.

FLORIAN, SAINT, 190-230; the patron saint of Poland; b. in Austria, served as a capt. in the Roman army, and was drowned during the Diocletian persecution. It is said that he was buried on the site of the monastery of St. Florian, near Linz; but that the remains were afterwards taken to Rome. In 1183, a portion of them was presented to king Casimir, and thenceforward Florian became Poland's patron saint. He is represented as pouring flames from a vessel, and is invoked for protection against fire. Aug. 4 is his day.

FLORIDA (*ante*), so called by the Spaniards because discovered on or about Easter (some say Palm Sunday, *Pascua Florida*), or because of the number of flowers that covered the country. Ponce de Leon, in search of the fountain of youth, was the first European to visit Florida, landing near the present St. Augustine in 1512. Vasquez, Verrazano, and De Geray successively visited the country in 1520-24. In 1526, Charles V. granted to Panfilo de Narvaez all the land from the extreme s. to the river Panuco. Narvaez took possession in 1528 with a large force, but met a strong resistance from the Indians, and finally perished by shipwreck off the coast, only 10 of his company of 440 living to reach Spain. In 1539, De Soto made an exploration, and a few years later (1562-64) a considerable number of French Huguenots sought refuge in Florida, but they were expelled by the Spaniards in 1565, "not as Frenchmen, but as heretics," as was learned from the placards attached to some who were hung on trees. This ferocity was as grimly repaid by the French, who captured the Spanish fort and strung up its defenders on the same trees, "not as Spaniards, but as cut throats and murderers," leaving the writhing bodies side by side with the dry bones of the Huguenots. The Spaniards established a fort at St. Augustine in 1565, which was captured in 1583 by sir Francis Drake, who found that two Englishmen had taken nominal possession of the country two years earlier. It does not appear that England undertook to hold possession, and there followed nearly a hundred years during which little was heard of the land of flowers; but in 1682, LaSalle, the explorer of the Mississippi, was in w. Florida, and in 1696 the Spaniards made a settlement at Pensacola. The English repeatedly attacked St. Augustine, alleging that the place was a haunt of freebooters. In 1763, Florida was ceded to England in exchange for Cuba. As soon as it was one of the English colonies, emigrants from the north began to settle, but in 1783, with the coming of our independence Florida was given back to Spain. After the purchase of Louisiana in 1803, there was much discussion about the boundaries between the new territory and Florida, but the Perdido river now separating Florida from Alabama was fixed upon. In the war of 1812, the British organized expeditions against the United States in Florida, and gen. Jackson captured Pensacola as one of the offending towns, but it was soon restored to Spain.

By treaty and purchase, Florida became a part of the United States territory in July, 1821, and the next year was organized and a governor (gen. Jackson) appointed. Immigration again became rapid, but the warlike Seminoles who dwelt in the impenetrable everglades were a constant source of danger, and desultory war was almost constant. After years of fighting that cost the United States more than \$10,000,000 and 1500 lives, the Indians were prevailed upon to migrate to the territory w. of the Mississippi, and now only about a hundred linger in Florida. The removal was effected in 1842. Florida became a state Mar. 3, 1845, being the 14th of those admitted, and making 27 states in all. Florida seceded from the United States Jan. 10, 1861, and gave her full share of assistance to the rebellion, seizing the United States navy-yard at Pensacola, and the military stations except Key West. The union troops in 1862 recovered St. Augustine, Jacksonville, and Fernandina, but were defeated in a severe engagement at Olustee, where they lost 1200 men. When the rebellion collapsed Florida was an early applicant for re-admission, repealing her secession ordinance in Oct., 1865, repudiating the confederate debt, accepting emancipation, and forming a new constitution which was modified in accordance with the amendments to the federal constitution; and in June, 1868, Florida was re-admitted, since which period material progress has been rapid.

Florida is a long peninsula running s.e. between the Atlantic and the gulf of Mexico, with a narrow arm on the n. reaching along the gulf more than half the width of Alabama and, naturally, belonging to that state. This arm was once known as West Florida, the peninsula being East Florida. The s. extremity, Key West, is the utmost s. bound of the union, in 24° 30' north. The line of the state is irregular, running from the Atlantic along St. Mary's river to Elliott's Mound in Okfenokee swamp; thence a little n. of w. to Appalachicola river at Chattahoochee; then n. along the river to 31° n.; thence on that parallel to the Perdido river; and down the river to the gulf. The line described was the original division between English territory (Georgia), Spanish

(Florida), and French (Louisiana). The area of Florida is about 60,000 sq. m. (est. 59,268). The peninsula is 375 m. long by 60 to 100 m. wide. The western arm is over 100 m. long by about 50 wide; the entire coast line of Florida is 1150 m., far exceeding that of any other of the states. There are harbors, but only a single bay on the ocean side, bay Biscayne; but on the gulf coast are Florida, Ponce de Leon or White Water, Ostego, Tampa, Wacassassa, Appalachee, Pensacola, Perdido, and several smaller bays, with St. George's sound at Appalachicola. The St. John's river, coming into the Atlantic near the n.e. corner of the state, and for 150 m. above its mouth, having a width of 2 m., runs s. parallel with the ocean through a series of lagoons and small lakes, more than 200 m. to Cypress swamp, and, with its tributaries, affords 1000 m. of steamboat navigation. The other principal rivers beginning at the w. are the Perdido, Escambia, Yellow, Choctahatchee, Appalachicola, St. Marks, Aucilla, Hatchee, Suwanee, Withlacoochee, Caloocahatchee, Kissimmee, Miami, and a number of streams from the everglades that drain Okechobee lake, the largest of the many lakes. This lake, n. of the everglades, in the s. part of the state, is said to cover more than 650 sq. miles. Other lakes are Orange, Kissimmee, Cypress, Istokpoga, Ahapopka, Lamona, Alligator, Sante Fe, Washington, Griffin, etc. The everglades, in the wet season, form a lake-like addition to Okechobee lake, and extend over about 3600 sq. m. to the gulf n. of cape Sable. The everglade region is studded with islands in size from a haycock to hundreds of acres, covered with thickets of vine and shrubs, with soil that is very fertile when reclaimed. The everglades occupy nearly the whole of Dade co. In 1840, the co. had a pop. of 412, which dwindled at each census to only 72 in 1870. There are no mountains in Florida, the whole state being of alluvial and diluvial formation, and at no place in the peninsula does the land rise 200 ft. above tide. Good water is to be had almost everywhere by digging three or four yards, and there are many natural springs of large capacity, some impregnated with lime or sulphur. Along the coast from cape Florida (off the center of the everglades) and curving s.w. for about 220 m. is a chain of reefs, rocks, and islands called "keys," terminating with the Tortugas islands. These keys are separated from the mainland by narrow bays and sounds, while s. of the keys and across a navigable strait is a long narrow coral formation known as Florida reef, which is the w. boundary of the gulf stream. Key West is the largest of the keys, having now a considerable city, a government military station, and a brisk trade.

In climate Florida is never cold, and never extremely hot. A record of 20 years shows the following mean for the several months named, at Key West and at St. Augustine :

	Latitude.	Jan.	April.	July.	Oct.	Year.	Rainfall.
Key West.....	24° 36'	66.68	75.58	83.00	78.11	76.51	36.49
St. Augustine.....	29, 53	57.03	68.73	80.90	71.88	69.61	47.86

The records at St. Augustine for more than a century show that the average of summer months was 86° and of winter months about 60°. The widest extreme noted ranges from 35° as the lowest, to 95° as the highest. Breezes from the ocean and gulf temper the air, and the nights are almost invariably cool. There is little of spring or autumn; summer lasts two thirds of the year; the rainy season covers the remainder. Florida is considered highly favorable to persons affected with pulmonary complaints, and is largely resorted to by consumptives. The ratio of deaths from consumption in 1870 was smaller in Florida than in any other state except Nevada, although many consumptives go there when quite incurable.

Florida was once well stocked with the larger wild animals, but few of them remain. Brown bears are found, and wolves may haunt the swamps, though they are believed to be extinct. The raccoon, the opossum, the ground-hog (woodchuck), rats, bats, and mice are common, and deer, rabbits, and squirrels are found. The most formidable animal is the alligator, thousands of them inhabiting the rivers, lakes, and everglades. The huge manatee (sea-cow) is occasionally taken, and the genuine crocodile is said to exist. The sounds along the keys are well stocked with turtles, some of enormous size. There are also sharks and enormous cuttle-fish along the coast, and abundance of edible fish in the rivers and lakes. There are ducks, wild turkeys, hawks, eagles, vultures, owls, and of small birds a vast variety of rich plumage, though not noted for song; but this deficiency is fully supplied by the mocking-bird, which in Florida reaches its highest perfection and fills the whole country with harmony.

Live-oak, pine, and hickory trees thrive well. Minerals are scarce, but some precious stones, corals, and calcareous limestone have been discovered. A singular natural feature is known as a "sink," a hollow worn in the limestone by underground streams. In many places there are underground streams large enough to furnish good water-power; and near Tallahassee is a lake, clear and cold, which is fed from subterranean streams.

The light soil of Florida, for the most part sand or loam overlaying clay, varies from uselessness in the pine barrens to extreme fertility in the bottoms and hummocks. Most of the grains of the temperate zone grow in the n. part of Florida; and in other sections tropical fruits thrive. Corn grows in all parts. Long and short staple cotton, sugar-

cane, tobacco, sweet potatoes, rice, hemp, coffee to some extent, peanuts in profusion, rye, oats, and a little wheat, are grown. Favored by its southern position, Florida is able to furnish abundance of garden vegetables to the northern cities from a month to six weeks in advance of the local season, and many steamers are engaged in this trade in early spring. The orange is the most valuable fruit, but lemons, pineapples, figs, olives, citrons, bananas, etc., are grown. Florida oranges are of excellent flavor, and their cultivation is rapidly extending. The yield, usually some hundreds to a tree, is sometimes as high as 10,000 to a tree. About 100 trees are raised to the acre, and very large profits are easily made, but after some years of delay. Peaches and plums do well, but apples and pears do not. Grapes are prolific and excellent. Cocoanuts, plantains, ginger, pepper, cloves, and pimento can be grown. Indigo was formerly cultivated, but has been abandoned. Besides live-oak (valuable for ship timber) and pine, there are splendid flowering magnolias, cypress, dogwood, bay-laurel, satinwood, ligum vitæ, palmetto, mangrove, torchwood, the poisonous manchineel, and the castor oil bean, which is here a perennial tree.

Florida is not a manufacturing state, but there are important exports of turpentine, pitch, rosin, and lumber. There are many cigar manufactories, and salt is made by solar evaporation. The fisheries of Florida are valuable, and the sponge fishery is productive. The commerce of the state is mostly domestic, though Key West, Pensacola, and Fernandina have a considerable West India and Mexican trade.

The principal cities and towns are Jacksonville, Key West, Pensacola, Fernandina, Tallahassee (the capital of the state), and St. Augustine (the oldest white settlement in the United States).

There were published in Florida Jan. 1, 1879, 33 newspapers and magazines: 2 daily, 2 semi-weekly, 28 weekly, and 1 monthly. Florida had in 1878, 87,750 persons of school age (4 to 21 years); enrolled, 31,133; average attendance, 21,787; 970 teachers; school fund, \$243,500; income, \$17,962; expense, \$102,817; value of school property, \$116,934. There were no colleges, but one of agriculture was soon to be founded. The entire receipts for education were \$183,311; \$150,641 from taxation; \$17,962 from apportionment; \$11,108 from private sources; and \$3,600 from the Peabody fund.

There were at the beginning of 1879, open or in progress, 487 m. of railroad: the Florida, or Atlantic and Gulf and West India Transit, from Fernandina to Cedar Keys, 154 m.; the Jacksonville, Pensacola and Mobile, from Lake City to Chattahoochee, 150 m.; the Central, from Jacksonville to Lake City, 59½ m.; the Atlantic and Gulf, from Live Oak to Dupont, Ga., 48½ m.; the Pensacola, from Pensacola to Pensacola Junction, Ala., 44 m.; the St. Johns, from Tocio to St. Augustine, 10½ m.; and two shorter roads.

The constitution adopted in 1868 gives the suffrage "to every male person of 21 years and upwards, of whatever race, color, nationality, or previous condition, who is a citizen of the United States, or who shall have declared his intention to become such, and have resided in Florida one year and in the county six months." After 1880 there is to be an educational qualification for voters. Slavery shall not exist; there are no distinctions on account of color or race; any attempt at secession is forbidden; the governor holds office for four years; other state officers, except the lieutenant-gov., are appointed by the governor and senate; there are 24 senators chosen for 4 years, and 53 assemblymen for 2 years; legislative sessions are annual and limited to 60 days; members have \$500 a year and 10 cts. per mile for travel. There is a supreme court of a chief-justice and two associates, who hold office during good behavior; also, circuit and county courts, and justices of the peace. Seven circuit court judges are appointed for eight years, and each holds annually two court sessions. The county court judges hold for four years; all judges are appointed by the governor and senate. Florida has two representatives in congress, and has voted six times for president: in 1848 (3 votes), for Taylor and Fillmore; 1852, Pierce and King; 1856, Buchanan and Breckenridge; 1860, Breckenridge and Lane; 1864, no vote; 1868, Grant and Colfax; 1872, Grant and Wilson; 1876, Hayes and Wheeler. The state has furnished no high officers of the federal government. [For latest statistics, see APPENDIX.]

FLORIDA KEYS, a chain of low islands, or coral reefs, running for more than 200 m. in the form of a crescent around the s. extremity of the mainland of Florida, ending in the rocky reef known as the Dry Tortugas. Among the largest of them are Key Largo, and Key West or Thompson's island, on which the city of Key West is situated. The islands vary in size from a few yards to 25 sq. miles. Some are barren; many are covered with a dense growth of trees. Their flora is West Indian rather than continental. Fort Jefferson, a government military station, is on the Dry Tortugas. The whole pop. of these islands in 1870 was 5,533.

FLORID STYLE, in music, an epithet applied by modern musicians to any movement, or passage, composed in a brilliant, fanciful, rich, and embellished style.

FLOSS SILK, that which is broken in the reeling. It is afterwards macerated in water, pressed, dried, and spun into yarn, which is useful in making the coarser kind of silk or mixed goods.

FLOUR. See *MILL*, *ante*.

FLOURENS, GUSTAVE, 1838-71; a French socialist. In 1863, he gave at the college of France a series of lectures on the history of mankind. His theories as to the manifold origin of the human race gave offense to the clergy, and he was precluded from delivering a second course. He then repaired to Brussels, where he published his lectures under the title of *Histoire de l'Homme*; he next visited Constantinople and Athens, took part in the Cretan insurrection of 1866, spent some time in Italy, where an article of his in the *Popolo d'Italia* caused his arrest and imprisonment; and finally, having returned to France, he nearly lost his life in a duel with Paul de Cassagnac, editor of the *Pays*. In Paris he devoted his pen to the cause of republicanism, and at length, having failed in an attempt to organize a revolution at Belleville (Feb. 7, 1870), found himself compelled to flee from France. Returning to Paris on the downfall of Napoleon, he soon placed himself at the head of a body of 500 tirailleurs. On account of his insurrectionary proceedings he was taken prisoner at Creteil, near Vincennes, by the provincial government, and confined at Mazas, Dec. 7, 1870, but was released by his men on the night of Jan. 21-2. Mar. 18, he joined the communists. As colonel of the 19th and 20th arrondissements, he took part in an attack on Versailles, and early in the morning of the 3d of April was killed in a hand-to-hand conflict at Rueil, near Malmaison.

FLOUR MANUFACTURE, NEW PROCESS OF, is a way of making flour so as to retain that portion of the wheat which by the old methods is eliminated in the form of "middlings." This part of the grain being very nutritious, its retention enhances the value of the new flour and increases its quantity by over 8 per cent. The "new process" has been extensively introduced in the great flour-mills of this country. The grinding is done at a comparatively low rate of speed, and the result is obtained by bolting-cloths of a peculiar sort. It is unfortunate that the "new process" has thus far been successfully applied only to spring wheat.

FLOUR, SELF-RAISING, is flour in which has been incorporated, by the process of sifting, a yeast-powder, compressed in proper chemical proportions, of bicarbonate of soda and tartaric acid, or its compound with potassa, the bitartrate of potassa, or cream-tartar. Flour thus prepared, after receiving the proper quantity of salt, and being mixed with a due proportion of water or milk, yields carbonic acid gas, under the influence of which the dough becomes porous, when it is ready to be put into the oven and baked. The yeast-powder is sold in bottles or in cans, in quantities suited to family use. As tartaric acid yields no nutritive property, the use of acid phosphate of lime in the form of powder has been introduced in its stead, upon the theory, suggested by prof. Horsford, that it restores to the flour the phosphates of the wheat which were removed with the bran. Liebig commends this process. The great convenience of this way of making bread is its chief recommendation; the dough may be baked at once, whereas the process of fermentation consumes several hours. As the constituents of the yeast-powder do not act upon each other in the absence of water, it may be mixed in the flour beforehand, and flour thus prepared is extensively sold in the United States under the name of "self-raising flour." The same process may be applied to a mixture of rye and wheat flour, and also to oat or corn meal.

FLOWERS, LANGUAGE OF, or FLORIGRAPHY, is supposed to have been used among the earliest nations; but the Greeks are the first users of whom we have any trustworthy records. They carried it to a very high degree, using flowers as types of everything interesting, public as well as private. Shakespeare confides to us that "fairies use flowers for their character;" while other poets tell us that the flowers themselves speak. In earlier times florigraphy was much cultivated by the nations of continental Europe; but after the decline of the power of Rome, little attention was given to it. Its study was revived, however, during the middle ages, when chivalry became pre-eminent; and it received great development at the hands of the Roman church. The variety of the flowers that adorned the altar enabled the worshiper to distinguish between feasting and fasting ceremonies. Flowers have had an important part in all mythologies. Oak was the patriot's crown, bay the poet's, and the myrtle the crown for beauty. The olive was the token of peace as the ivy was the emblem of Bacchus. The significance of many flowers is derived from their properties. The amaranth has a very poetical meaning, being called "the never-fading" by the Greeks, because of its duration. It has been selected to typify immortality; and is referred to in Longfellow's poem "The Two Angels." The daisy has received much attention from the poets: Shakespeare says "its white investments figure innocence." The rose—by universal suffrage made the queen of the flowers—has a symbolism varying with its color; a single red rose signifies "I love you;" the small white bridal rose typifies happy love; and the moss rose-bud, a confession of love. The varied and magnificent flora of America offers a vocabulary replete with brilliant and original tokens. Flowers are also the emblems of several European countries, such as the *fleur-de-lis* of France, the thistle of Scotland, and the shamrock of Ireland. The following are some well-known flowers, with their symbolism as used in poetry:

Anemone—Frailty, Anticipation.
Apple Blossom—Preference.
Buttercups—Riches.
Calla—Magnificent beauty.

Candytuft—Indifference.
Cowslip—Youthful beauty.
Daffodil—Unrequited love.
Dandelion—Coquetry.

Forget-me-not—True love.
Fox-glove—Insincerity.
Geranium—Deceit.
Gentian—Virgin pride.
Golden-rod—Encouragement.
Heliotrope—Devotion.
Honeysuckle—Fidelity.
Hyacinth—Sorrow.
Lilac—Fastidiousness.

Marigold—Contempt.
Lily—Majesty. Purity.
Narcissus—Self-love.
Pansy—Thoughts.
Poppy—Oblivion.
Snow-drop—Friend in need.
Sweet William—Gallantry.
White Violet—Modesty.

FLOYD, JAMES, D.D., 1806-63; b. N. Y.; educated at Columbia college and in Europe. He was a Methodist pastor in New York, Connecticut, and elsewhere. In 1848, he was put on the committee to revise the denominational hymn-book, and much of the improvement in the new version is due to him. In 1854, he was presiding elder of the New York district of the N. Y. E. conference; and in 1856, editor of the *National Magazine* and corresponding secretary of the tract society. He was an early and able opponent of slavery.

FLOYD, a co. in n.w. Georgia, on the Alabama border, drained by the Coosa river, and intersected by the Selma, Rome, and Dalton railroad; 540 sq.m.; pop. '80, 24,418—9,456 colored. The surface is hilly and in some parts mountainous, and much of it is covered with forests. Cotton, corn, wheat, and pork are the chief products. Iron and plumbago are found. Co. seat, Rome.

FLOYD, a co. in s. Indiana, on the Ohio river, intersected by the Louisville, New Albany, and Chicago railroad; 148 sq.m.; pop. '70, 23,300. The surface is hilly, and the soil fertile, producing the usual cereals. Limestone, slate, and timber are plentiful. Co. seat, New Albany.

FLOYD, a co. in n.n.e. Iowa, on Cedar and Shell Rock rivers; intersected by the Milwaukee and St. Paul, the Burlington, Cedar Rapids, and Northern railroads, and the Cedar Falls and Minnesota branch of the Illinois Central railroad; 550 sq.m.; pop. '80, 14,677. The surface is chiefly prairie, with considerable timber. Soil fertile, producing wheat, corn, etc. Co. seat, Charles City.

FLOYD, a co. in e. Kentucky, on Big Sandy river; 520 sq.m.; pop. '70, 7,877—171 colored. The surface is hilly, and mostly pasture land. Corn and pork are the staple products, and there are valuable beds of coal. Co. seat, Prestonburg.

FLOYD, a co. in s.w. Virginia, bounded on the s.e. by the Blue Ridge; 270 sq.m.; pop. '70, 9,824—997 colored. The surface is hilly, and mostly covered with forests. Corn, wheat, oats, and butter are the principal products. Co. seat, Floyd Court House.

FLOYD, JOHN BUCHANAN, 1805-63; b. Va.; son of gov. John; graduated at South Carolina college, and practiced law in Arkansas; afterwards in Virginia, where he was a member of the legislature. In 1849, he was chosen governor. He was again member of the legislature, and a strong advocate of the nomination of Buchanan for president. When Buchanan became president he made Floyd secretary of war. At the commencement of the rebellion Floyd resigned. He had done his utmost while secretary to dispose of the regular army so as to favor the projected rebellion. He scattered the forces to remote stations, and transferred a great supply of arms from the northern to the southern states. Besides this he abstracted \$870,000 in government bonds, for which he was indicted. In the confederate service he was a brig.gen.; was defeated at Ganley bridge, losing his baggage, ammunition, and camp equipage. At Fort Donelson he was besieged by Grant, but the night before the surrender he, with gen. Pillow and 3,000 men, made his escape into Tennessee. With this inglorious episode his military career ended.

FLOYD, WILLIAM, 1734-1831; b. N. Y.; one of the signers of the declaration of independence, and a gen. during the revolution. He was a delegate to the first continental congress, and while in attendance at Philadelphia, an English fleet arrived off the entrance of Long Island sound, with the purpose of invading and ravaging the island. Floyd returned, gathered the militia of Suffolk co., and made so strong a show of resistance that the British abandoned their purpose. He was eight years in the congress. In 1777, he was elected to the New York state senate, and was also a member of the first congress under the federal constitution. As one of the presidential electors in 1801, he voted for Jefferson, and in the same year was chosen to the New York constitutional convention.

FLUDD, ROBERT, 1574-1637; an English physician and mystic philosopher. After studying at Oxford, he traveled for several years in Europe, where he became fascinated with the writings of Paracelsus. Fludd believed in two universal principles, the northern or condensing, and the southern or rarefying power, and in the existence of four elemental spirits, corresponding to fire, air, earth, and water. The chief principle of his philosophy was that man was a representation in miniature of the universe, and he endeavored to trace the analogy between what he called the microcosm and the macrocosm. Absurd as such propositions now seem, they at that time provoked serious refutation from Kepler, Gassendi, and Mersenne. De Quincey considers Fludd to have been the immediate father of freemasonry, as Andrea was its remote father.

FLUE, NIKOLAUS VON DER, SAINT, 1417-87; b. Switzerland, of a good family. He was well educated, was a soldier of distinction, and for nearly 20 years a judge and counselor of state. In 1467, he abandoned his family and became a hermit in the Alps, going bareheaded and barefooted, and living solely upon charity. Ten years later he began his career as a preacher. In 1481, he visited the diet at Sanz and was instrumental in preserving the confederation. He was made a saint in 1669.

FLUENTS and FLUXIONS. See **FLUXIONS**, *ante*.

FLÜGEL, GUSTAV LEBRECHT, 1802-70; a German orientalist, was educated in theology at Leipsic, and studied oriental languages in Vienna and Paris. He published an edition of the *Koran*, and among his later works are the *Concordantie Corani Arabice* and *Die arabischen, türkischen und persischen Handschriften*.

FLÜGEL, JOHANN GOTTFRIED, 1788-1855; a German lexicographer. He emigrated to America in 1810, and made a special study of the English language. Returning to Germany in 1819, he became professor of English in the university of Leipsic. In 1838, he became American consul, and in later years representative and correspondent of many literary and scientific institutions of the United States. His fame rests chiefly on his *English-German and German-English Dictionary*.

FLUME, THE, a gorge in the Franconian mountains, Lincoln, N. H. shut in between high walls of rock. It is much frequented by summer tourists, and a cascade some 600 ft. in height adds to its picturesque charm. Littleton, in Grafton co., is 16 m. distant.

FLUOHYDRIC ACID, or HYDROFLUORIC ACID. See **FLUORINE**, *ante*.

FLUORESCENCE (*ante*), the action of certain substances which absorb light waves of short wave-length and re-emit the same light energy in waves of greater length. Some experiments are thus: A beam of sunshine, thrown by a mirror into a dark room through a hole in a shutter, is made to traverse a sheet of violet-colored glass, or a tank containing a strong solution of copper ammonia-sulphate. All but violet and actinic rays are excluded, and the room is nearly dark. If we place in the violet beam a mass of uranic nitrate it blazes with green, illuminating the room. Potassic chromate, or potassic ferrocyanide, remains dark in the same beam. If the beam traverse a jar of water upon which float some chips of horse-chestnut bark, beautiful streams of blue run down as the water dissolves the esculine of the bark. A transparent solution of quinine appears opaque, with a luminous milky precipitate. Designs in paper, drawn with quinine sulphate, though invisible in common light, become luminous in the violet beam; if drawn with varnish thickened with thallene, the effect is yet more brilliant. The design may be cut from paper coated with thallene and pasted on other paper; in electric light which has passed through yellow, green, or red glass, nothing will appear, but in light through cobalt blue glass, the thallene sketch will glow like fire against a background of black velvet. If the light be analyzed by a prism, the thallene or quinine designs will become luminous not only in the blue or violet parts of the spectrum, but also in that part usually black, where the actinic rays fall. It will be remembered that a pencil of light is a compound which may be analyzed by a prism, the result being several pencils of light of different vibrating, or wave-lengths; that the longer waves are those of the red, the wave-lengths constantly diminishing to the violet, and to the extra-luminous or chemical rays, whose plane in the spectrum is beyond the violet. Ordinary substances have no power to vary the wave-lengths, but either absorb the light or return it unchanged. A red object seems so because it absorbs all other light and returns the red rays; if the object is placed in light from which the red is removed, as in the green of the spectrum, the object having no red to return, returns nothing, and is black. Hence, an object may show very different color when the light comes from it by transmission or reflection; for example, it may reflect only red, transmit only green, and absorb the remainder. In 1832, prof. G. G. Stokes described a series of observations and experiments and explained the nature of the action called fluorescent. The subject has also been investigated by Becquerel, Hagenbach, and Morton.

The power of exciting fluorescence exists in all rays, but is most notable in the very short rays of the violet. Bodies which have any capacity for fluorescence will show it in the violet, and may show it in other parts of the spectrum. For most bodies there are special wave-lengths which show fluorescence better than other wave-lengths which lie between. Fluorescent excitement and absorption are in some degree correlated; thus, in general, those rays which are most powerful exciters are most absorbed; so that if a beam of light has been sifted by a prism, those rays may be missing which most excite fluorescence. This applies to light, but not to bodies. Many absorbing bodies, as permanganate of potash, have no fluorescence whatever, while certain fluorescent bodies have very complex selective absorption.

The most powerfully fluorescent bodies known are the following: *Solids*: thallene, emerald green; chrysogen, light green; chrysene, yellow green; platino-cyanide of barium, uranic salts generally, and especially certain phosphates, double oxychlorides, and sulphates, also canary-glass, emerald green; platino-cyanide of magnesium, red; platino-cyanide of potassium, blue; solarized thallene (petroleumene), blue; anthracene, purplish blue. *Solutions*: acid quinine sulphate in water, blue; alkaline or neutral

esculine in water, blue; bichlor-anthracene in alcohol, purple; bisulpho-bichlor-anthracenic acid in water, purple; extract of stramonium-seeds in water or alcohol, green; solution of morin, obtained from fustic or Cuba-wood in water, with alum, green; alcoholic solution of chlorophyll, best obtained from tea-leaves exhausted with water previously, red. The list includes only some of the more brilliantly fluorescing bodies, and might be greatly extended.

FLUORIDE OF ALUMINIUM AND SODIUM. This is the mineral *cryolite*, which is found in large quantities in Greenland, and is an important source of the metal aluminium (q.v.), and also of caustic soda, which is used in the manufacture of soap, carbonate of soda, and various salts; also of an opaque white glass (see SODA). The formula of *cryolite* is $\text{Al}_2\text{F}_6\text{NaF}$, a double fluoride of aluminium and sodium, having the percentage composition of fluorine 54.2, aluminium 13, sodium 32.8. See ALUMINIUM.

FLUORIDE OF CALCIUM. See FLUOR SPAR, *ante*.

FLUORIDE OF SILICON. This interesting compound is prepared by heating a mixture of powdered quartz, sulphuric acid, and fluor spar in a glass flask. A double reaction takes place, by which hydrofluoric acid and sulphate of calcium, water, and the gaseous fluoride of silicon are evolved. The gas is colorless, and very suffocating if breathed; on that account must be dealt with very cautiously. Water decomposes it into silica and hydrofluosilicic acid. See FLUORINE.

FLUORIDE OF SODIUM. This salt, which is the cheapest of the soluble salts of fluorine, is prepared by the action of hydrofluoric acid on carbonate of soda. It is also conveniently prepared by fusing a mixture of twenty parts of Glauber's salt, fourteen of carbonate of lime, and ten of fluor spar, with an excess of charcoal. The fluoride of sodium nearly pure may be extracted by water in percolation. Oxysulphide of calcium remains as an insoluble residue on the filter.

FLUORINE (*ante*). Fluorine has a strong tendency to form double fluorides: those containing hydrogen have acid reactions, as hydrofluosilicic acid, $2\text{HF}, \text{SiF}_4$; hydroborofluoric acid, HF, BF_3 . This tendency to form double salts has suggested the idea that fluorine is diatomic, and that its equivalent should be 38 instead of 19. On this hypothesis, which, however, is not generally accepted, hydrofluoric acid could be H_2F , instead of HF . Hydrofluosilicic acid, or silicofluoric, or fluosilicic acid, is formed by the action of water on fluoride of silicon (q.v.). The reaction may be represented as follows: $3\text{SiF}_4 + 2\text{H}_2\text{O} = 2\text{H}_2\text{SiF}_6 + \text{SiO}_2$. A special apparatus is required on account of the tendency of the gelatinous silicic acid, one of the results of the decomposition, to stop up the tube which delivers the gaseous fluoride of silicon. This stoppage takes place when the tube is moist. By sinking it beneath the surface of mercury which underlies the water, the difficulty is obviated. When the bubble of gas escapes from the mercury and rises above the water, that part of the silica which has not escaped forms a sort of envelope, and a continuous tube of silica is often formed. The acid solution is cleared by passing it through linen, ordinary filtration being impracticable, as the filter is liable to become clogged. A modification of the process has been introduced by Tessie Du Motay, which has an important relation to arts and manufactures. A paste composed of alumina, fluor-spar, carbon and silica is baked into bricks, which, on being melted again in a furnace, become decomposed, the fluoride of silicon passes off, and leaves a residuum in the furnace. The gaseous fluoride of silicon is passed through a series of wooden chambers in which sprays of water are arranged to play upon sloping shelves of glass. The acid solution is carried by gravity from one chamber to another until it contains about 8 per cent of acid. It is a sour fuming liquid which does not ordinarily corrode glass. When evaporated in glass, however, decomposition takes place, and the hydrofluoric acid which remains combines with the glass. Hydrofluosilicic acid is used in testing for barium and potassium. It is proposed to use it in preparing various salts from the potassium chloride beds at Stassfurt, Germany.

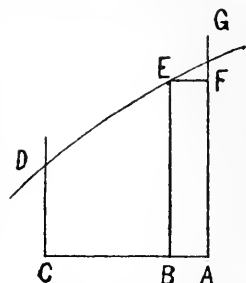
FLUOSILICIC ACID. See FLUORINE, *ante*.

FLUSHING, a township and village in Queen's co., N. Y., on Flushing bay, a projection of Long Island sound, 8 m. n.e. of New York; on the n. side division of the Long Island railroad; pop. of township, '75, 15,357; of village, nearly half as many. In addition to railroad, there is constant steamboat communication with New York and other places. The village is one of the most charming in a delightful region. The streets are wide and well shaded, the houses stand apart and are surrounded with fruit trees and shrubbery, and the country round is highly cultivated. For nearly a century this village has been famous for nurseries of fruit and forest trees and flowers. It is a favorite place of residence for the business men of New York and Brooklyn; and in and near the village the descendants of some of the most important of the old Long Island families have found a home. As lately as 1873, the large oak tree under which George Fox, the famous founder of the sect of Quakers, so often preached, was still flourishing. Few places are better supplied with churches and educational institutions. Among the latter are the Flushing seminary for girls, St. Joseph's academy for young ladies, St. Joseph's convent, and St. Mary's seminary for boys. There are nearly a dozen churches, representing all the leading denominations. The villages of College Point and Whitestone are included in the township.

FLUVANNA, a co. in central Virginia, on the James river, intersected by the Rivanna river; the James river canal passes along the s. border; 170 sq. m.; pop. '70, 9,875—5,097 colored. The surface is generally level, and the soil is fertile, producing corn, tobacco, wheat, and oats. Co. seat, Palmyra.

FLUXIONS (*ante*). Imagine a point to move uniformly in the direction of a fixed line, and, at the same time, to have a variable transverse motion depending upon a law which determines the character of the curve or line thus generated. The indefinite part of the curve up to any point, as *D E* in the diagram, is the *fluent* and the exceedingly small element of the curve that is generated in the next infinitesimal, but constant, period of time, as *E G*, is the *fluxion*. These are both variable except in the case of straight lines.

Let *E* denote the location of the generating point at any time, *t*; *C A* the straight line in the direction of which motion is uniform, and *C D* a line perpendicular to *C A*. Let *E F* be the distance through which *E* moves parallel to *C A*, and *F G* the distance parallel to *C D* in the next infinitesimal though constant space of time *d t*. Then, at the end of the time *t + d t* the point will be at *G*, and *E G* will be the part of the curve generated in the time *d t*.



Passing from the consideration of the motion of a point in a plane to that of a point in space, it is evident that the generating point will describe a straight line, or a curve of single or double curvature. Equations can be constructed formulating laws of motion which will cause the general point to trace any curve whatever, and from these equations the natures of the curves can be discovered. The science of fluents and fluxions is based upon the above principles.

Any plane figure can be generated by the motion of a straight line, and any volume by the motion of a plane figure. In all cases, the portion of a plane figure or volume generated in the time *t* is the fluent, while that generated in the time *d t* is the fluxion. In practice, the method of integrals and differentials has superseded the system of fluents and fluxions, chiefly because the rotation of the latter is too cumbersome. The fluxion of a fluent is represented by a dot over a letter, or, in complicated expressions, by a dot occupying the position of an exponent outside of a parenthesis; thus \dot{x} denotes the fluxion of *x*, and $\left(\frac{\sqrt{x-y}}{x^2}\right)$ denotes the fluxion of $\frac{\sqrt{x-y}}{x^2}$. For fluxions of a higher order a dot is written over the fluent or without the parenthesis for each unit in the order.

FLYING—FLIGHT (*ante*). The problem of aerial navigation has a strong fascination, which is not confined to men of science alone. When we remember the marvelous freedom of movement enjoyed by volent as compared with non-volent animals, it is not surprising that the ability to fly has always been an object of ambition with man. The traditions of *Dædalus* and *Icarus* illustrate the attempts of the ancients in this direction; while the aeronautic societies existing at the present day in Great Britain, France, Austria, and other countries, show that the subject has a permanent hold upon the imagination and the interests of mankind. The societies alluded to embrace men of the highest scientific attainments, and as they evince great activity and publish their proceedings at regular intervals, the world is likely to be promptly apprised of any new discovery. Men of science in general have no belief that the dreams of the enthusiasts will ever be fulfilled; but there are some who think it not too much to hope that mankind will ultimately learn to navigate the air as easily and safely as the water. It is a problem of mechanical science and skill; and they assert that the obstacles in the way of success are not apparently greater than those which two centuries ago were almost universally supposed to make steam navigation impossible. If the problem be ever solved, it will probably be by studying more closely than ever the structure and habits of volent animals. If men are to learn to fly, the birds must be their teachers. It is not evident how the balloon can ever be successfully employed for aerial navigation, for, though its vertical movement may to a certain extent be controlled, it is at the mercy laterally of every wind that blows; and so, while it may be kept for a long time aloft, it can never be sure of reaching any desired destination. Progress in aërostation, as in many other scientific inquiries, has probably been retarded by false analogies. The air cannot be navigated after the same fashion as the water, for it is a radically different element. A very slight consideration shows that although the muscles of man may not be of sufficient strength to enable him to use wings, it does not necessarily follow that he may not find a way of managing these appliances successfully by mechanical power. Flying creatures are for the most part as heavy, bulk for bulk, as other animals, and flight in every instance is the product, not of superior levity, but of weight and power directed upon properly constructed flying organs. This shows that a flying machine need not necessarily be a light, airy structure, exposing an immoderate amount of surface. On the contrary, it suggests that it should be a compact and moderately heavy and powerful structure, trusting for elevation and propulsion entirely to its flying appliances, whether

actually moving wings, or screws, or aëro-planes wedged forward by screws. It should attack and subdue the air, without allowing the air an opportunity of attacking or subduing it. It should smite the air intelligently as a master; and its vigorous, well directed thrusts should in every instance be able to elicit an upward and forward recoil. The flying machine of the future, there is reason to believe, will be a veritable example of *multum in parvo*. It will launch itself into the ocean of air, from which, by means of its traveling surfaces, however fashioned and however applied, it will extract the recoil or resistance necessary to carry it forward. Art should follow nature in this matter. As there are active and passive surfaces in the flying animal, so there should be active and passive surfaces in the flying machine. The active surfaces in flying creatures are always greatly in excess of the passive ones, from the fact that the former virtually increase in proportion to the spaces through which they are made to travel. Nature not only distinguishes between active and passive surfaces in flying animals, but also strikes a just balance between them, and utilizes both. She regulates the surfaces to the strength and weight of the flying creature, and the air currents to which the surfaces are to be exposed and upon which they are to operate. In her calculations she never forgets that her flying subjects are to control and not to be controlled by the air. Prof. J. Bell Pettigrew, an English scientist, has analyzed the movements of flying creatures, and reproduced them by the aid of artificial wings. In his work *On the Mechanical Appliances by which Flight is attained in the Animal Kingdom*, 1867, he has given an account of his investigations and discoveries which will be of great advantage to all those who are trying to work out the problem of artificial flying. The first properly authenticated account of an artificial wing was given by Borelli in 1670. His investigations and experiments are of great value. His plan of artificial wing is indorsed by Chabrier, Straus-Durkheim, Girard, and Marey. The latter reproduces Borelli's artificial wing, and even his text, at a distance of nearly two centuries. But the artificial wing of prof. Pettigrew is a more exact imitation of nature than Borelli's. He recommends a double elastic wing, to be applied to the air like a steam-hammer, by being fixed to the head of the piston. He also recommends an elastic aërial screw consisting of two blades which taper and become thinner towards the tips and posterior margins. The peculiarity of his wings and screws consists in their elasticity, their twisting action, and their great comparative length and narrowness. They offer little resistance to the air when they are at rest, and when in motion, the speed with which they are driven is such as to insure that the comparatively large spaces through which they travel shall practically be converted into solid bases of support. A revolution in the construction of flying models has taken place since the enunciation of prof. Pettigrew's issues in 1867. Elastic aëro-planes are now advocated by Mr. Brown, elastic aërial screws by Mr. Armour, and elastic aëro-planes, wings, and screws by M. Pénau. The latter constructed models to fly by three different methods—1, by means of screws acting vertically upwards; 2, by aëro-planes propelled horizontally by screws; and 3, by wings which are flapped in an upward and downward direction. These models were so far successful as to make a considerable degree of progress and offer hints for future guidance. Mr. Henson designed a flying machine in 1841, combining aërial screws with extensive supporting structures. Mr. Wenham, in 1867, thinking to improve upon Mr. Henson, invented what he designated his aëro-planes. Mr. Stringfellow, who was originally associated with Mr. Henson, and constructed a successful flying model in 1847, built a second model in 1868, in which Mr. Wenham's aëro-planes were combined with aërial screws. This model was in view at the exhibition of the aëronautical society of Great Britain, held at the crystal palace, London, in 1868. It was remarkably compact, elegant, and light, and obtained the \$500 prize of the exhibition for its engine, which was the lightest and most powerful ever constructed. The machine for which it was made was not successful. It violated nature, in that while it weighed less than 12 lbs., its engine exerted a third of a horse power. No flying creature of that weight possesses a tithe of the power indicated. In 1874, Mr. Moy invented an aërial steamer, consisting of a light, powerful skeleton frame resting on three wheels; a very effective light engine constructed on a new principle, which dispenses with the old-fashioned cumbrous boiler, narrow horizontal aëro-planes, and two very large aërial screws. In its general features, Mr. Moy's machine resembles that of Mr. Stringfellow. It must not be supposed that while foreign inventors have been working in this field the subject has not engaged attention on this side of the Atlantic. In the United States patent office reports may be found descriptions of hundreds of inventions for aërial navigation; but they all have proved delusive. Still, investigation and experiment are going on in Europe and America, and the engineers who persevere in this work in the face of so much discouragement deserve well of science. Most of them appear to have come to the settled conclusion that the mystery of flight can be cleared up only by an intelligent study of the structure and mode of application of the flying organs of animals. It is to natural flight and the principles which underlie it that the aëronaut must look for a solution of the intensely interesting but vastly complicated problem of aërial navigation. [Condensed from *Encyc. Brit.*, 9th ed.]

FODDER, GREEN. See ENSILAGE.

FOG, or MIST (*ante*.) On the Atlantic coast of America fogs are frequent, and are for the most part caused by the varying temperature of the ocean currents. The cold cur-

rent coming down Baffin's bay is by the revolution of the earth thrown against the coast from Newfoundland down to cape Hatteras, where it passes under the gulf stream which runs w. of it, but in an opposite direction. The gulf stream, that vast body of warm water from the tropics, heats and saturates with moisture the air under which it passes. When the wind is in a direction to drive this warm moist air over the cold current, the moisture condenses into fog and is blown inland. Therefore an e. or s.e. wind will bring fogs along the coast of the eastern states and Newfoundland. Further towards the s. only an e. wind will bring these fogs. The same holds good on the Pacific coast, where there is a corresponding cold stream near the shore and a warm stream further out. Fogs are brought to Oregon and California by w. and n.w. winds.

FOGARAS, a co. in Transylvania, e. Austria, on the frontier of Roumania; pop. of the old district, 70, 86,943; the larger portion of whom being Wallachians, the remainder Hungarians and Saxons. The surface is mostly mountainous, and the climate is cold and unfavorable to agriculture. Cattle-raising is the principal business. The district was changed into a county in 1876. The capital, FOGARAS—pop. 67, 4,714—is on the Aluta river, 32 m. w.n.w. of Cronstadt. It has a strong castle, dating from the 14th c., and restored 300 years later.

FOGELBERG, BENEDICT ERLAND, 1786-1854; a Swedish sculptor, son of a copper-founder. He studied art in Stockholm, where he was much influenced by the sculptor Sergell. In 1818, he went abroad, and studying in Paris and Rome, passed nearly all the remainder of his life in the latter city. He at first selected his subjects from classic mythology; but in later life the weird myths of Scandinavia had great charms for him, and appeared in his statues of "Odin," "Thor," and "Balder." His portraits and figures, such as "Gustavus Adolphus," "Charles XII," and "Birger Jarl," are faithful and dignified works.

FOGGIA, or CAPITANA'TA, a province in s. Italy, on the Adriatic, intersected by the railroad from Bologna to Otranto; 2,955 sq.m.; pop. 72, 322,758. It is divided into three districts. The peninsula of Gargano extends e. into the Adriatic. The Gargano mountains extend along the e. part of the province, and in the s.w. are spurs of the Apennines. Between these mountain chains are broad and fertile valleys. The rivers are not large. The productions are olives, grapes, grain, tobacco, flax, cattle, sheep, etc. Capital, Foggia.

FOGO, or FUEGO, one of the Cape Verd islands w. of Santiago; about 40 m. in circumference, formed almost entirely of the slopes of a volcanic mountain of 9,157 ft. elevation. The volcano was first known to be in action in 1680, and the last eruption, which was the cause of great destruction, occurred in 1847. The great trouble is the lack of water, droughts being sometimes so protracted as to cause famine. Ordinarily the island is exceedingly fruitful. Chief town and port, Nossa Senhora da Luz.

FOG-SIGNALS (*ante*). The importance to navigation along the coast of the United States of these signals, has led to many experiments and improvements. The bells, gongs, guns, etc., used on board ship are little depended upon; but instead, there have been placed at many points on the coast, whistles and horns of great power, which are sounded at frequent intervals when the state of the atmosphere requires it. The simplest and commonly most powerful signal employed by the light-house board, is the locomotive whistle, operated by a steam boiler with a pressure of 50 to 75 lbs. The sounds from the land are distinguished from those on board ship by the length of the notes and the intervals between. The whistles are from 8 to 10 in. in diameter, and are operated automatically. The Daboll trumpet, which is worked by air condensed by a caloric engine, is next in importance. This trumpet itself provides the resounding cavity, and the vibratory motion of the air is produced by a reed. This reed is an iron bar, the larger trumpets being 18 in. long, 2 in. wide, and three quarters of an inch thick, gradually lessening towards the free end. A pressure of 15 lbs. to the sq.in. is the highest power employed. This trumpet is especially valuable in places where water is not procurable, because its motive power is hot-air. The most powerful instrument yet employed as fog signal, is that known as the siren trumpet. The impulse to the air which produces the sound is given by a flat drum, or a hollow cylinder with a short axis, one end of which is perforated to admit the steam from a pipe connected with a locomotive boiler. On the other side the drum is also perforated with eight holes, in connection with which is a revolving disk, which is, in its turn, provided with the same number of holes. As the disk revolves, these eight holes are alternately opened and shut, allowing egress to as many gusts of steam, which in turn, produce a violent movement of the air, giving rise to a most powerful sound, reinforced by the resonance of a trumpet of suitable length. The requisite velocity is communicated to the disk by an engine attached to a boiler. The sound from this instrument can be heard in still air at a distance of from 20 to 30 m., even during a dense fog. This trumpet is worked by a pressure of 75 lbs. of steam in an ordinary locomotive boiler. But, although these sounding horns are very powerful, there is always an amount of uncertainty in the results. The trumpet of which one note may be heard 20 m. off may send the next note less than two thirds the distance. Sound travels in the quiet, dry open air at mean temperature, at the rate of about 750 m. per hour, and an opposing or crossing wind,

traveling 10 m. an hour, seriously disturbs and retards the transmission of sound. The intervention of rain, mist, or fog will also disturb and retard; and temperature has a very distinct influence. Add to these disturbing causes, the fact that no two men hear exactly alike, and the uncertainty of dependence upon sound is apparent.

FOIX, PAUL DE, 1528-84; a French prelate and diplomatist; studied in Paris and Toulouse, and lectured on civil law. At the age of 19, he became a councilor of the *parlement* of Paris. In 1561, he was ambassador to England; and in 1565, he vainly endeavored to persuade Elizabeth to consent to the surrender of Havre to the French. He was afterwards sent to negotiate a marriage between Elizabeth and the duke of Anjou. On account of his previous toleration of the Lutherans, he narrowly escaped perishing in the massacre of St. Bartholomew; but the following year, being intrusted with an embassy to Italy, he had an audience with the pope and fully established his orthodoxy. In 1576, he became archbishop of Toulouse. He was afterwards intrusted by the French king with various important missions, and in 1579 was appointed ambassador to Rome, where he died.

FOKIEN, a province in s.e. China bordering on the Formosa channel, Pacific ocean; 53,480 sq.m.; pop. 22,799,556. Several islands are included in the province. The country is mountainous, but is highly cultivated and unusually fertile. The products are tea, rice, wheat, barley, sweet potatoes, tobacco, sugar, camphor, indigo, alum, etc. There are manufactures of cloths and porcelain. Capital, Foo Chow.

FOLENGO, TEOFILO, 1491-1544; otherwise known as MERLINO COCCAJO or COCAJO, one of the principal macaronic poets of the 16th century. At the age of 18, he became a member of the Benedictine order, and while a monk wrote Latin verses in the style of Virgil. About 1516, he forsook monastic life and wandered round the country, with a young woman of good family, Giorlana Diedo, often in great poverty, as he had no resource but his poetic talent. His first publication was *Merlini Cocaii Macaronicon*, which relates the adventures of a fictitious hero named Baldus. Though coarse and gross, it contained much genuine poetry and became very popular. Folengo's next work was *Orlandino*, an Italian poem of eight cantos composed in rhymed octaves. In the same year (1526) he re-entered a monastery, and in a later poem related the experiences of his vagabond life. He subsequently wrote religious poems, and for a short time assumed the charge of a Sicilian monastery. He is frequently quoted by his great contemporary, Rabelais.

FOLEY, JOHN HENRY, 1818-74; an Irish sculptor who began his work in Dublin, where he took several prizes. He appeared as an exhibitor in 1839, with his "Death of Abel" and "Innocence." In 1840, "Ino and Bacchus" gave him immediate reputation. Among his many works were "Lear and Cordelia;" "Death of Lear;" "Venus receiving Æneas;" "Prospero and Miranda;" statues of Hampden and Selden for the houses of parliament; "Egeria;" "The Elder Brother," (in Comus); "Caractacus;" "Goldsmith;" "Burke;" "Reynolds;" "O'Connell;" "Gough;" "Outram;" "Asia," (a symbolical group, and with it the "Prince Consort" for the Albert memorial in Hyde Park); and "Stonewall Jackson" for South Carolina. The statue of "Outram" is considered his master-piece.

FOLGER, PETER, 1617-90; b. England. In 1635, he settled in Martha's Vineyard, Mass., and in 1663, removed to Nantucket. His daughter Abia was the mother of James and Benjamin Franklin. Folger was the author of the singular work in verse, *A Looking-glass for the Times; or the Former Spirit of New England revived in this Generation*. The writer addressed himself to the governors of the colonies at the time, advocating liberty of conscience, and toleration of the Anabaptists, Quakers, and all sects who had hitherto suffered persecution.

FOLLEN, AUGUST (OR ADOLF) LUDWIG, 1794-1855; a German poet who studied theology and law, and after leaving college edited the Elberfeld *Allgemeine Zeitung*. He was accused of political plotting and imprisoned for two years. Upon his release he went to Switzerland, taught school, and became a farmer. He wrote many minor poems, a romance in verse entitled *Tristan and Isolde*, and the celebrated *Nibelungenlied*. He translated the Homeric hymns, and Tasso's *Jerusalem Delivered*; and published a compilation of Latin hymns. He is most favorably known by his *Bildersaal Deutscher Dichtung*.

FOLLEN, CHARLES THEODORE CHRISTIAN, PH.D., LL.D.; 1795-1840; b. Hesse-Darmstadt, Germany; a clergyman and reformer. He was educated at Giessen, where he distinguished himself by his enthusiasm in the cause of liberty, and fell under suspicion of the authorities as a promoter of revolution. In 1814, he joined the army raised to resist Napoleon, but returned to his studies at the close of the campaign. In 1818, he was appointed by the university lecturer on jurisprudence. His advanced views of human rights and his frankness in avowing them brought him into difficulties, and he left Giessen for Jena, where a similar fortune awaited him. He was accused of complicity in the assassination of Kotzebue, and was twice arrested, but after the strictest examination was honorably acquitted. He afterwards found it necessary to take refuge in Switzerland, where he was appointed professor of Latin in the cantonal school at Coire, in the Grisons. This post he was soon forced to resign on account of the alleged

anti-Calvinistic tendency of his teaching. He was next appointed lecturer upon law and metaphysics at the university of Basel. The German government demanded his surrender as a revolutionist. This demand was twice refused, but upon its renewal for the third time the Swiss authorities yielded and endeavored to arrest him, but escaping through Paris to Havre, he sailed for the United States, where he was warmly welcomed. In 1825, he was appointed a teacher of German at Harvard college, and, three years later, became teacher of ecclesiastical history and ethics in the divinity school. From 1830 to 1835, he was professor of German literature at Harvard. Later on, he preached in the first Unitarian church of New York city, and in 1839 accepted a call to the pastorate of a church of the same denomination in Lexington, Mass. From the commencement of the anti-slavery movement he was an avowed abolitionist and a warm friend and associate of Garrison. His fearless opinions on this question made him very unpopular in his adopted country, but after suffering banishment from his native land for his love of liberty, he found it difficult to reconcile the American declaration of independence with the systematic enslavement of the negro. He lost his life in the burning of the steamboat *Lexington* on Long Island sound, Jan. 13, 1840.

FOLLEN, ELIZA LEE, 1787-1860; b. Boston; daughter of Samuel Cabot, and wife of prof. Charles Follen. She was well known in literature as the author of *Selections from Fenelon*; *Well-Spent Hour*; *Married Life*; *Little Songs*; *Twilight Stories*; and poems and songs.

FOLLETT, Sir WILLIAM WEBB, 1798-1845; attorney-general of England, son of an army officer, completed his education at Cambridge and the inner temple. He commenced practice as a pleader in 1821, and was called to the bar in 1824, going on the western circuit the next year. His success was immediate and his progress rapid. In 1830, he married a daughter of sir Ambrose Harding Gifford, chief-justice of Ceylon. In 1835, he was returned to parliament for Exeter, and soon gained distinction. Under sir Robert Peel he was appointed solicitor-general. In 1835, he was knighted. In 1844, he succeeded sir Frederick Pollock as attorney-general, but his health failing, he was forced soon afterwards to give up practice.

FOLLY ISLAND, off the coast of South Carolina, in Charleston co., extending from Stone river to Lighthouse inlet. It was the scene of some important operations during the war of the rebellion.

FOLSOM, NATHANIEL, 1726-90; b. N. H. He commanded a company at fort Edward in 1755, and served as brig. gen. at the siege of Boston until July, 1775. He was a member of the continental congress for two terms; a counselor, and president of the convention which framed the constitution of New Hampshire in 1783.

FOLZ, or FOLCZ, HANS, b. Germany, 1478. He was one of the famous Minne-singers, and wrote rhymes and dramatic pieces. His lyrics are spirited, graceful, and moral in tone; but some of his prose writings are thoroughly the reverse.

FOND DU LAC, a co. in s.e. Wisconsin embracing the s. end of Winnebago lake, and all of lake Horicon; intersected by the Chicago and Northwestern, the Sheboygan and Fond du Lac, and the n. division of the Milwaukee and St. Paul railroads, and drained by Horicon river; 752 sq. m.; pop. '75, 50,241. It has a prairie surface with much timber; and the soil is fertile, producing wheat, corn, oats, barley, potatoes, butter, wool, hops, etc. Co. seat, Fond du Lac.

FOND DU LAC (*ante*), a city, the seat of justice of the co. of the same name in Wisconsin; at the mouth of Fond du Lac river where it passes into Winnebago lake; on the Chicago and Northwestern railroad where the Sheboygan and Fond du Lac railroad intersects, and on the Fond du Lac, Amboy and Peoria railroad; 177 m. n.w. of Chicago and 63 m. from Milwaukee; pop. '75, 15,303. There is communication by steam-boats through Winnebago lake and Fox river with all the great lakes. The city contains a court-house, an opera-house, a number of halls, a high school, and about 20 churches, embracing 9 denominations. There are also two convents, a female institute, two public libraries, and manufactories of lumber, carriages, flour, paper, machinery, engines, etc. The supply of water is from artesian wells, of which there are more than 1000. There are many fine private residences. The city has a delightful situation, and a very large and increasing trade and manufacturing business.

FONSECA, ELEONORA PIMENTEL DE, 1758-99; b. Naples, of an illustrious family, and famous for beauty, learning, and poetical talent. In 1784, she married the marquis Fonseca, and became one of the ladies-in-waiting of queen Caroline of Naples. In consequence of some remarks about the queen's intimacy with one of the ministers, she fell from favor. After the flight of the Neapolitan royal family, the marchioness became a warm partisan of the French, and rendered herself conspicuous by making public addresses in their favor. When the Neapolitan rule was restored the revengeful queen Caroline caused the marchioness to be beheaded, ostensibly on account of her favoring the French.

FONSECA, PEDRO DA, D.D., 1528-99; prof. at Coimbra and Evora; sometimes called the "Portuguese Aristotle." He wrote commentaries on Aristotle's works; also a treatise on foreknowledge and freewill. He resided for seven years at Rome, and was the instructor of Molina.

FONTAINE, JEAN DE LA. See LA FONTAINE, *ante*.

FONTAINE, PIERRE FRANÇOIS LEONARD, 1762-1853, was one of a French family of architects. At the age of 16, he was employed upon government hydraulic works and he afterwards studied in Paris. During the revolution he was in England. Under Bonaparte he was employed to restore the palace of Malmaison, and afterwards upon various public works down to the time of Louis Philippe. In 1812, he was elected member of the academy of fine arts; and in 1813, became architect to the emperor. In company with Percier he published several works on architecture.

FONTANA, LAVINIA, 1552-1614; daughter of Prospero, and a painter of no little fame, especially in portraits. She was much employed by the ladies of Bologna, and, going thence to Rome, painted the likenesses of many illustrious personages, being under the particular patronage of the family (Buoncampagni) of pope Gregory XIII., who died in 1585. The Roman ladies, from the days of this pontiff to those of Paul V., elected in 1605, showed no less favor to Lavinia than their Bolognese sisters had done; and Paul V. was himself among her sitters. Some of her portraits, often lavishly paid for, have been attributed to Guido. In works of a different kind also she united care and delicacy with boldness. Among the chief of these are a Venus in the Berlin museum; the Virgin lifting a veil from the sleeping Infant Christ, in the Escorial; and the Queen of Sheba visiting Solomon. Her own portrait in youth—she was accounted very beautiful—was perhaps her masterpiece; it belongs to the counts Zappi of Imola, the family into which Lavinia married. She is deemed on the whole a better painter than her father. From him naturally came her first instruction, but she gradually adopted the Caraccesque style, with strong quasi-Venetian coloring. She was elected to the academy of Rome, and died in that city.

FONTANA, PROSPERO, 1512-97; a painter of Bologna, and one of the most distinguished of the Fontana family. He was a pupil of Innocenza da Imola, and upon leaving his studio, worked for some time for Vasari and Pierino del Vaga. From the former he acquired the rapid, and in many instances careless style which distinguished some of his earlier works. He possessed great fertility of imagination, but his mannerism and the inaccuracy of his drawing marred his best efforts. He undertook an immense amount of work, and executed it with rapidity. He is said to have painted an entire hall in the Vitelli palace at Città di Castello in a few weeks.

He belonged to the same school as Sabbatini, Sammachini, and Passerotti. His greatest successes were in portraiture, in which branch of art he stood so high that towards 1550 Michael Angelo introduced him to pope Julius III. as a portrait-painter; and by this pope he was pensioned, remaining at the pontifical court with the three successors of Julius. He was much respected and considered a sort of arbiter and oracle among his professional brethren. Returning to Bologna, he opened a school of art, in which Lodovico and Agostino Caracci became his pupils—and upon this fact his claim to distinction mainly rests. His subjects were mostly chosen from sacred and profane history, and from fable. He left a large quantity of work in Bologna—the picture of the Adoration of the Magi, in the church of S. Maria delle Grazie, being considered his masterpiece—not dissimilar in style to that of Paul Veronese.

FONTANEL, an artificial ulcer sometimes raised by a physician for the benefit of its derivative effect. Any hard mass kept under the skin for a time will produce the necessary irritation. The term F. is applied also to the soft pulsating spots on the head of a very young infant. Of these, there are three or four, the principal one being at the crossing of the main sutures. It generally closes within two years after birth, owing to the extension of the adjoining bones.

FONTARABIA. See FUENTERRABIA.

FONVIELLE, WILFRID DE, b. Paris, 1828; was interested in mathematics, aeronautics, and journalism. Of late years he has made numerous balloon ascents, in order to carry on scientific experiments at great altitudes. During the siege of Paris he escaped from the city in a balloon, and proceeding to London, gave a series of lectures on the benefits of a republican form of government. His principal scientific works are *L'Homme Possible*; *Les Merveilles du Monde Invisible*; *Eclairs et Tonnerres*, translated into English under the title of *Thunder and Lightning*; and *L'Astronomie Moderne*. An account of the balloon ascents made by M. Fonvielle, Mr. Glaisher, and others, appeared in French in 1870, and an English translation was published in 1871, under the title of *Travels in the Air*. In addition to the above-mentioned works, M. Fonvielle has written several political pamphlets.

FOO-CHOW. See FU-CHOW-FOO, *ante*.

FOOLHIS, or FELLATAH. See FULHIS, *ante*.

FOOT, SOLOMON, 1802-66; b. Vt.; graduated at Middlebury college in 1826; principal of Castleton seminary, 1826-28; tutor in Vermont university, 1827; professor of natural philosophy in the academy of medicine at Castleton, 1828-31; admitted to the bar, 1831. He was a member of the state legislature, and, during his last three terms, speaker of the assembly. From 1843 to 1847, he was a member of congress, and from 1850 until his death, United States senator. He was for a number of years president *pro tempore* of the senate.

FOOTA JALLON, or **FUTAJALLON**, a district of Senegambia, Africa, around the sources of the Senegal, the Gambia, and the Niger; crossed by 13° n. and 13' w. It is a rough and mountainous country, but fertile in parts, producing corn, rice, fruits, oil, wine, wax, honey, etc. Iron is manufactured. The people are Mohammedans of the Foulah race, and are friendly with the whites, from whom they claim to be descended. There is trade with Timbuctoo and with coast towns. The government is elective. Capital, Timbo.

FOOTA TORO, a district forming the n. portion of Senegambia, Africa, on the Senegal river, in 15° to 16' n. It is flat, low, and hot, but fertile, with large forests. The pop. is estimated at 800,000, for the most part negroes and Mohammedans, who cultivate cotton and rice, and have a theocratic government. There are some large towns in the district, of which Medinalla, the capital, is the chief.

FOOTE, a co. in s.w. Kansas, formed since the census of 1870; 720 sq. miles. It is crossed by the Arkansas river, and the Atchison, Topeka, and Santa Fe railroad. The surface is generally level, and the soil is fertile.

FOOTE, ANDREW HALL, 1806-63; b. Conn.; entered the navy in 1822; in 1833, was flag lieutenant of the Mediterranean squadron. In 1838, he circumnavigated the earth in the *John Adams*, sloop-of-war, and was concerned in the attack on the pirates of Sumatra. In 1849, he was in the African squadron, actively engaged in suppressing the slave trade. In 1856, he commanded the *Portsmouth* on the China station, and arrived off Canton just in time to protect Americans and their property in the war then beginning between China and England. His ship was fired upon by the Canton forts, and the apology which he demanded was refused. He immediately attacked the forts, and captured the strongest of them by storm, the others afterwards surrendering. They were manned by 5,000 men, of whom 400 were among the killed and wounded, while Foote lost only 40 of his 280 men. In the war of the rebellion, he was in command of the Brooklyn navy-yard. Being capt. and flag officer of a fleet intended to operate in the western waters, he sailed from Cairo, Ill., Feb. 4, 1862, with seven gunboats, to attack fort Henry on the Tennessee. Two days afterwards he took the fort in an hour. On the 14th, he attacked fort Donelson on the Cumberland, but was unsuccessful. Although severely wounded, he went down the Mississippi and began the siege of island No. Ten, which he quickly reduced. In 1862, he was made rear-admiral, and was about to take command of the South Atlantic squadron when he died. He was the author of *Africa and the American Flag*, and *Letters on Japan*.

FOOTE, HENRY STUART, 1800-80; b. Va.; a graduate of Washington (Va.) college; admitted to the bar in 1822. In 1824, he started a newspaper in Tusculum, Ala. In 1826, he went to Mississippi, and in 1847, was chosen United States senator. He identified himself with the moderate Southern party, and favored compromise on the slavery question. In 1852, he became governor of Mississippi. In 1855-56, he was in California, acting with the "Know-Nothing" party; but he returned to Mississippi in 1858. He denounced secession while it was under discussion; but after the rebellion broke out he ardently upheld it, and was a member of the confederate congress, though a severe critic of Jefferson Davis. After the war, he resided in Washington. He was a man of ability, and a graphic writer, as was shown in his *Personal Reminiscences of Public Men*, and *Texas and the Texans*; but he was a quarrelsome politician, and fought several duels.

FOOTE, SAMUEL AUGUSTUS, LL.D., 1780-1846; b. Conn.; graduated at Yale in 1797, and practiced law. He was a member of congress 1819-23, and in 1833; speaker of the state assembly 1825-26; and senator of the United States 1827-33. He was the author of the famous resolution which provoked the great debate between senators Hayne of S. C. and Webster of Mass. This resolution, on which was based the most remarkable debate that has ever taken place in the country, was in itself of little moment, having reference merely to the survey of the public lands.

FOOT-WASHING, an eastern custom of very early times, having its origin in necessities produced by climate and modes of dress, and in the obligations attached to the rites of hospitality. In the most primitive times, the feet were without covering and sandals afforded protection only to the sole. Consequently, after any journey in the heat and sand, bathing the feet, if not absolutely required, was at least convenient and refreshing. The custom prevailed in the days of Abraham as appears from his invitation to the travelers who approached his tent: "Let a little water be brought and wash your feet and rest yourselves under the tree." In like manner, Lot said afterwards to two of the same strangers: "Turn, I pray you, into your servant's house and tarry all night and wash your feet." From Scripture and other sources, we learn that the servants of a household were accustomed to perform this work for the guests, and thus it became a significant sign of humility. Knowledge of this custom, and of the facts connected with it, is necessary in order to appreciate that remarkable action which is recorded of the Savior, John xiii., at the last paschal supper, and which he himself instanced as a symbol of humility. In the east, abundant occasions arose for a literal imitation of the example. Many Christians became noted for kind hospitality to their fellow-disciples, of which provision for washing the feet was a customary part and a

significant token of the whole. But the command gradually came to be obeyed in the letter only, and not in the spirit. Augustine speaks of the practice as kept up in his times, and also of doubts entertained concerning the proper day on which the ceremony ought to be performed. When it had become a ceremony to be performed only once a year, not only was the value of the observance reduced to its minimum, but great positive disadvantage attended it. In proportion as the spirit of the command was lost, its ceremonial was exalted and adorned. In 694, the synod of Toledo decided that the anniversary of the passover was the proper day for this observance. In the Greek church, foot-washing was elevated into a sacrament. In the Latin church, it was strenuously recommended as a sacrament for the remission of daily sins. In the middle ages, it was observed chiefly at the installation of bishops and coronation of princes. In Greek convents and at the Russian court, it is still practiced with great solemnity. In the papal court, in the regal courts of Vienna, Munich, Madrid, and Lisbon, and in Roman Catholic cathedrals and convents, it is observed to this day by washing the feet of twelve persons, generally poor old men. At Rome, in the Clementine chapel, at the beginning of the celebration, the strain, "A new commandment I give unto you," is sung; the representatives of the apostles take their seats, dressed in white woolen tunics; and the pope, in similar attire, sprinkles a few drops of water on the right foot of each, then wipes and kisses it. After this, a repast is given, at which the pope and his cabinet wait on the old men, who, at the close, take with them the tunics and towels, with the addition of a small gratuity in money. Luther opposed this literal and restricted ceremonial as worthless, and inculcated rather a spirit of true humility and general helpfulness to all, according to actual opportunities and needs, saying—"If you wish to wash your neighbor's feet, see that your heart is humble and help every one in becoming better." The Anabaptists, at the reformation, continued the practice. The Moravians revived it, but without strictly enforcing it. Some minor modern sects have adopted it and attach great importance to its literal observance. The church of England, in its early days, imitated the letter of the command; but now in commemoration of it assembles annually at Whitehall, corresponding in number to the years of the sovereign's reign, a company of poor people, to each of whom are given clothes, food, and pieces of money equaling in number the years of age of the reigning monarch.

FORAGE (*ante*). The daily ration in the U. S. army is, for each horse 14 lbs. hay and 12 lbs. oats, barley, or corn. For a mule the same amount of hay with 9 lbs. grain. Leaves of Indian corn are used in default of hay. The consumption of forage during active army operations is enormous, and the weight is $4\frac{1}{2}$ times as much as that of all other subsistence supplies. During the war of the rebellion, there were issued from the depot of Washington 4,500,000 bushels of corn, 29,000,000 bushels of oats, and 490,000 tons of hay. Partial reports of the quartermaster-general show issues of forage during the war as follows:

22,816,271 bushels of corn, costing.....	\$29,879,314
78,663,799 bushels of oats.....	76,362,026
1,518,621 tons of hay, costing.....	48,595,872
Total.....	<u>\$154,837,212</u>
The weight of these supplies in lbs. was—Corn.....	1,277,711,176
Oats.....	2,517,241,568
Hay.....	3,037,242,000

making a total of 6,832,194,744 lbs.—numbers interesting as showing the magnitude of the operations necessary to provide and distribute these few items of the expenses of war.

FORBACH, a t. of Lorraine, Germany; the chief town of a circle, on an affluent of the Rossel, and on the Metz and Saarbrücken railway, $5\frac{1}{2}$ m. s.w. of Saarbrücken. Its industries include brewing, tanning, and the manufacture of glass, soap, and pasteboard. At a short distance from the town are large iron-works which employ 1500 workmen. There are also many extensive coal-mines in the vicinity. Forbach possesses schools of various grades, a Roman Catholic and two Protestant churches, and a synagogue. After the battle on the neighboring heights of Spicheren, Aug. 6, 1870, in which the French under gen. Frossard were defeated by the Germans under prince Frederick Charles, the town was occupied by the German troops, and at the conclusion of the war it was annexed to Germany.

FORBES, ALEXANDER PENROSE, 1817-75; b. Edinburgh; was the second son of lord Medwyn. He was partially educated at the Edinburgh academy, and studied under Rev. Thomas Dale, the poet, in Kent; he also attended the Glasgow university, and obtaining an appointment in the Indian civil service, left England for Madras. Returning to his native country in 1839, he obtained a Sanscrit scholarship in Brasenose college. At Oxford he became associated with Pusey, Newman, and Keble; and in 1844 was ordained deacon and priest in the church of England, and held a curacy. In 1846, he returned to Scotland for a while, but afterwards became vicar of Leeds. After the death of bishop Moir, he was called to the see of Brechin. He was ever zealous in labor, and untiring in the founding and extension of churches. He was once prosecuted

for heresy, but he made a powerful defense, and was acquitted with censure and admonition. His *Treatises on the Nicene Creed* and *The Thirty-nine Articles*, and various commentaries, reviews, etc., were highly esteemed.

FORBES, DAVID, 1828-76; b. Douglas, Isle of Man. When a boy he manifested an enthusiastic delight in everything connected with science, and at the age of 14 had already acquired a remarkable knowledge of chemistry. This subject he studied at the university of Edinburgh, and he was still young when he was appointed superintendent of the mining and metallurgical works at Espedal in Norway. Subsequently, returning to England, he became a partner in a firm of nickel-smelters, and visited Chili, Bolivia, and Peru. Micro-petrology and chemical geology owe much to his researches. Besides reports for the iron and steel institute, of which, during the last years of his life, he was foreign secretary, he wrote upwards of 50 papers on scientific subjects, among which are the following: *The Action of Sulphurets on Metallic Silicates at High Temperature*; *The Relations of the Silurian and Metamorphic Rocks of the South of Norway*; *The Causes producing Foliation in Rocks*; *The Chemical Composition of the Silurian and Cambrian Limestones*; *The Geology of Bolivia and Southern Peru*.

FORBES, JOHN, 1710-59; b. Scotland; became an officer in the Scottish grays in 1745. He served in the German war; then came to America and was made brig. gen. In Nov., 1758, he took possession of the French fort Du Quesne at the junction of the Ohio and Monongahela, and named the place Pittsburgh, after the elder Pitt, then prime minister of England.

FORBES, JOHN MURRAY, D.D., b. 1807; graduated at Columbia college in 1827, and at the Episcopal theological seminary in 1830. In 1834, he became rector of St. Luke's church, New York, and was for a time professor of pastoral theology and pulpit eloquence in the pastoral theological seminary. In 1844-47, he was a delegate to the general conference of the church. In 1849, he, about the same time with John Henry Newman and Henry Edward Manning, went over to the Roman Catholic church. Both the Englishmen are now (1880) cardinals. In 1852, Forbes was appointed by the bishop of South Carolina his theologian in the plenary council of the Roman Catholic church held at Baltimore, and in 1854 he acted in the same capacity for the bishop of Boston in the provincial council held in New York. In 1859, he returned to the Protestant Episcopal church, and gave his reasons for so doing in a letter to archbishop Hughes, of which a portion follows: "It is now nearly ten years since, under your auspices, I laid down my ministry in the Protestant Episcopal church to submit myself to the church of Rome. The interval, as you know, has not been idly spent; each day has had its responsibility and duty, and with these have come experience, observation, and the knowledge of many things not so well understood before. The result is, that I feel I have committed a grave error, which, publicly made, should be publicly repaired. When I came to you, it was, as I stated, with a deep and conscientious conviction that it was necessary to be in communion with the see of Rome; but this conviction I have not been able to sustain, in face of the fact that by it the natural rights of man and all individual liberty must be sacrificed; not only so, but the private conscience often violated, and one forced, by silence at least, to acquiesce in what is opposed to moral truth and justice. Under these circumstances, when I call to mind how slender is the foundation in the earliest ages of the church upon which has been reared the present papal power, I can no longer regard it as legitimately imposing obligations upon me or any one else. I do now, therefore, by this act, disavow and withdraw myself from its alleged jurisdiction." In 1862, he was, by special favor, restored to the Protestant Episcopal ministry, and in 1869 was made an officer of the general theological seminary.

FORCE, PETER, 1790-1868; b. N. J. He was a printer in New York, and afterwards in Washington, where he started a statistical annual, *The National Calendar*, continuing it for 16 years. During the presidency of John Quincy Adams he published the *National Journal*, the first to be stigmatized with the title of "official organ." He was mayor of Washington and president of the national institute for the promotion of science. His great work was the compilation of the *American Archives*, consisting of 9 folio volumes, published by the government. In this work, he was employed for 30 years. The collection was purchased for the congressional library. He published also historical tracts relating to the early history of the colonies.

FORCHHAMMER, JOHANN GEORG, 1794-1865; b. Prussia; studied at Kiel and Copenhagen, and was with Oersted and Esmarch in a mineralogical exploration of Bornholm. He was lecturer in the university of Copenhagen on chemistry and mineralogy in 1823, occupied the same position in the polytechnic school in 1829, and in 1831 became professor of mineralogy in the university and curator of the geological museum. He succeeded Oersted in 1851 as director of the polytechnic school and secretary of the academy of sciences.

FORCHHEIM, a fortified t. of Bavaria, circle of Upper Franconia, near the junction of the Weisent with the Regnitz, 16 m. s.s.e. of Bamberg. It has a castle, a collegiate and two other churches, a synagogue, a monastery, and a hospital. Its industries include brewing, tanning, soap-boiling, and glass manufacture. Forchheim is of very early origin. Charlemagne transplanted thither, in 804, a number of Saxons from the

Elbe, and made it an important commercial entrepôt. In the 9th and 10th centuries, many assemblies, both of the princes and the kingdom, were held at Forchheim, and, in 890, a council of the church. In 1007, it was presented by the emperor Henry II. to the newly founded bishopric of Bamberg, but in 1040, Henry III. united it again to the kingdom. Henry IV., however, again presented it to the bishopric of Bamberg, with which it remained till 1802, when it came into the possession of Bavaria. In 1552, it was captured by the margrave Albert Brandenburg, and in 1634, besieged by Bernhard of Weimar. Its fortifications were restored in 1791. Aug. 6 and 7, 1796, a battle took place in its vicinity between the French and Austrians, in which the French held possession of the field. Forchheim ceased to occupy the position of a fortified town after 1838. Pop. '75, 3,847.

FORCIBLE ENTRY consists in taking or keeping possession of real property through threats or force, with no authority of law. To make such entry forcible, there must be such acts of violence, menaces, or gestures, as may give reason to suspect personal injury or danger in making a defense. But the force must be more than is implied in mere trespass. There are in most of the states statutes regulating proceedings in cases of forcible entry, directing the manner of proceeding for the restoration of property and the punishment of the offender. The plea of ownership is not satisfaction for the defendant, for no one may enter even upon his own property in any other than a peaceable manner. Nor can he be excused on the plea that he entered to enforce a lawful claim or make a distress, nor on the plea that possession was finally obtained by entreaty.

FORD, a co. in n.e. Illinois, on the upper streams of Vermilion river, intersected by the Illinois Central and the Wabash railroads; 450 sq.m.; pop. '70, 9,103. The surface is mostly prairie, and the soil is fertile, producing corn, wheat, etc. Co. seat, Paxton.

FORD, a co. in s.w. Kansas, intersected by the Atchison, Topeka, and Sante Fe railroad; 1080 sq.m.; pop. 2,160. It is an agricultural region. Co. seat, Dodge City.

FORD, RICHARD, 1796-1853; b. England; author of one of the earliest and best of travelers' handbooks. He was educated for the law, but never practiced. He traveled in Spain and other parts of Europe, and began his literary career by contributions to the *Quarterly Review*. Among his more important works are *The Policy of England towards Spain*, and *Handbook for Travelers in Spain*.

FORD, THOMAS, an English musician attached to the court of prince Henry, the son of James I. His works consist of canons and other concerted pieces of vocal music, chiefly with lute accompaniments. The principal collection of his works is *Musike of Sundrie Kinds set forth in Two Books*, etc.

FORDHAM, now a part of the city of New York, but formerly a village in Westchester county. It is noted as the seat of St. John's college, an institution under the charge of the Jesuits, built on 20 acres of land, and comprising several buildings. The college has 10 professors, 77 undergraduates, and 150 students. Besides this institution, there are in the vicinity the St. Joseph theological seminary and St. Mary's church. Near by are the considerable estates of the Lorillards with their factories, the Jerome skating-pond, and Jerome park, one of the finest race-courses in the country, managed by the American jockey club. Pop. 2,000.

FOREIGN ATTACHMENT (*ante*). In several of the states of the American union the statutes provide for action similar to foreign attachment, and authorize the levy upon property of absent, non-resident, and absconding debtors. But the laws vary, and a case can best be understood after consulting the enactments.

FOREIGN JUDGMENT is the decree of any tribunal outside of the jurisdiction in which it operates. Such judgments depend for their value and enforcement upon agreement between states and nations. The states of the American union are absolute in their several dominions, and are guided by their own laws; but the needs of society and order require a recognition of the rights of other states, and hence we have, as between nations, a recognition of the efficiency of state enactments under certain prescribed formulæ. The constitution provides that "full faith and credit shall be given by each state to the public acts, records, and judicial proceedings of every other state; and that congress may prescribe the manner in which such acts, records, and proceedings shall be proved, and the effect thereof." Under this provision congress enacted the law which says: "The records and judicial proceedings of the courts of any state shall be proved or admitted, in any other court within the United States, by the attestation of the clerk and the seal of the court annexed, if there be a seal, together with the certificate of the judge, chief justice, or presiding magistrate, as the case may be, that the said attestation is in due form. And the said records and judicial proceedings, authenticated as aforesaid, shall have such faith and credit given to them, in every court within the United States, as they have by law or usage in the courts of the state from whence such records are or shall be taken." This general rule holds good in nearly all cases, except divorce. In that, the opinions are almost as diverse as the laws. The Roman Catholic church, and countries where that is the established religion, deny the right of divorce. English courts hold that no foreign authority can dissolve an English marriage. In the

United States, although the statutes differ materially, a divorce granted in good faith, according to law in any state, is recognized in all other states. A few years ago the facility with which divorces could be obtained in one of the western states became so notorious and so much a cause of scandal that the laws of that state were amended in that respect.

FOREIGN LAWS. Such laws have no absolute power beyond the jurisdiction of the government enacting them, except by the comity and good neighborhood of nations or states. In the American union, it is the practice of all states to give credence and regard to the laws of all other states, and in personal causes these laws are enforced by extradition or more generally a writ of requisition. In relation to federal government, the states are not regarded as foreign, but domestic, and when the laws of any one of them are to be examined and applied in the federal tribunals, no proof is necessary. These courts take judicial notice of such laws in the same manner as each state by itself applies its own enactments, without requiring testimony in reference to them as matter of evidence. In like manner, the state courts take judicial notice of the laws of congress.

FOREIGN OFFICE, of Great Britain, was established in 1782 at the re-arrangement of the duties of the secretaries of state. It has charge of British interests in foreign countries. The secretary for foreign affairs negotiates treaties, selects diplomatic officers, and grants passports.

FOREKNOWLEDGE and FORE-ORDINATION. I. Foreknowledge, in theology, is God's absolute knowledge of all things before they come to pass. Such knowledge of anything is impossible to man. The human mind, through the limitations of its nature, fails to comprehend how the foreknowledge of God can be harmonious with the free agency of man. Its efforts to escape the difficulties that it cannot solve have produced various theories, among which are the following: 1. *That God may choose, sometimes, not to exercise his infinite capacity of knowledge,* in like manner as he does not always put forth the full measure of his omnipotence. But to this two answers are given. (1) That choice implies foreknowledge. God must know a thing in order to know whether he chooses not to know it. His knowledge of the thing must be perfect; if there were one point concerning which he was ignorant, that one might contain an element which would render the choice unwise and fatal; or which, if known, would prevent the choice from being made. (2) Supposing it possible for God to make such a choice, it would not meet the difficulty. Concerning the things that he chose to know, the question would still have to be asked, How can God's foreknowledge of them be consistent with human liberty in doing them? 2. *That foreknowledge of contingent events being impossible* (because it implies a contradiction), *there is no dishonor to God in affirming that of such events he has no foreknowledge.* To this the answers are: (1) If the impossibility here asserted really existed, there could be no foreknowledge whatever; for every event is contingent on something and perhaps on many things. Especially if the impossibility existed with reference to the moral actions of men, would God's moral government over them be impossible. (2) Foreknowledge of contingent events is not impossible to an infinite being, for it requires only knowledge of all things on which the events are contingent. And, on the other hand, certain knowledge concerning a contingent event does not take away its contingent character; for contingency is the opposite not of certainty, but of necessity. God's perfect knowledge of all contingencies may render him perfectly certain that an event will happen without any agency on his part in constraining it to happen. 3. *That since God's foreknowledge differs so much from everything among men to which the same name can be, in part, applied, and consequently from all ideas which they can form of it as belonging to God, argument concerning it must be groundless and controversy fruitless.* To this the answer is, that the conclusion is correct so far as the divine foreknowledge differs in kind from the foreknowledge of men; but if the difference between them be, in part, a difference only of degree, then there may be ground for argument and advantage from discussions wisely carried on. And if the wisdom be shown in excluding from discussion all questions concerning the *mode* in which the foreknowledge of God is consistent with the free agency of men, the full measure of advantage may be gained in clearly establishing the consistency as a *fact*. Beyond this the human mind has never advanced, and it is probably safe to say that it never will. The consequences of denying that the foreknowledge of God extends to all events (however contingent some or all of them may be) have been well shown by president Edwards. "It would follow from this notion (namely, that the Almighty doth not foreknow what will be the result of future contingencies) that as God is liable to be continually repenting what he has done, so he must be exposed to be constantly changing his mind and intentions as to his future conduct, altering his measures, relinquishing his old designs, and forming new schemes and projections. For his purposes, even as to the main parts of his scheme (namely, such as belong to the state of his moral kingdom), must be always liable to be broken through want of foresight, and he must be continually putting his system to rights, as it gets out of order through the contingency of the actions of moral agents: he must be a being who, instead of being absolutely immutable, must necessarily be the subject of infinitely the most numerous acts of repentance and changes of intention of any being whatsoever; for this plain reason, that his vastly extensive charge comprehends an infinitely greater number of

those things which are to him contingent and uncertain. In such a situation he must have little else to do but to mend broken links as well as he can, and be rectifying his disjointed frame and disordered movements in the best manner the case will allow. The supreme Lord of all things must needs be under great and miserable disadvantages in governing the world which he has made and has the care of, through his being utterly unable to find out things of chief importance which hereafter shall befall his system, which if he did but know, he might make seasonable provision for. In many cases there may be very great necessity that he should make provision, in the manner of his ordering and disposing things, for some great events which are to happen of vast and extensive influence and endless consequence to the universe, which he may see afterwards, when it is too late, and may wish in vain that he had known beforehand, that he might have ordered his affairs accordingly. And it is in the power of man, on these principles, by his devices, purposes, and actions thus to disappoint God, break his measures, make him continually to change his mind, subject him to vexation, and bring him into confusion."

II. *Fore-ordination* is included in what the Scriptures call the purpose of God with respect to the destiny of men. This in theology is presented as his purpose in eternity to do precisely those things, and only those, which he actually does in time. Since, therefore, it is admitted that all his actions are in accordance with infinite justice, wisdom, and love, it follows that his eternal purpose to perform precisely those actions was also infinitely just, wise, and good. The Scriptures teach that it was God's eternal purpose to create the world precisely as he did create it; to create men holy, yet liable to fall; to permit his fall, in view of all the circumstances attending it and of all the circumstances resulting from it; to provide a Savior suited to the wants of all, and able, as well as willing, to save all—"God so loved the world, that he gave his only-begotten Son, that whosoever believeth in him should not perish, but have everlasting life;" to commit the proclamation of redemption to men with sincerely uttered directions to spread it through all the world and to every creature; to address full and earnest invitations to every man; to give free salvation to every one who accepts these invitations, and to condemn every one who refuses or neglects them—to condemn him for his refusal or neglect, as well as for all his other sins. But all this could not be unless actual provision had been made for all and offered sincerely to all. This is harmonious with the Savior's own teaching—"This is the will of him that sent me, that every one who seeth the Son and believeth on him may have everlasting life." The eternal purpose of God, therefore, is that all who accept the offer of salvation through the atonement of Christ shall be saved, but that all who finally reject that offer shall be lost. Here, if God had not been an omniscient being, he might have arrested his purpose, thinking that he had made all the provision for the salvation of men that their character and condition required, and that it would certainly be gladly accepted by them. But he knew all that was in man. He foresaw that there would be an unwillingness on their part to accept this offer, and that the unwillingness would be general and universal. If, therefore, his purpose had rested here, the purpose of salvation would have failed. But his eternal purpose went further. God resolved to secure all the saving results from the atonement and mediation of Christ which he could secure consistently with his character and position as moral governor over the actual universe of free intelligences which he had seen it best to create. The development of this purpose may, by the light of Scripture and of facts, be traced, it is maintained, several steps further. God purposed to secure the salvation of a large part of mankind by taking them to himself and renewing their natures before they were able to accept the Savior personally for themselves, and consequently, before they were able to reject him. In this way, it is said, about one half of the race, being in infancy, are saved of every generation, of every country, and every form of religion. In regard to those who are continued in this life to years of accountability, God's purpose, it is maintained, is to secure the salvation of as many of them as he, in his infinite wisdom, considers it right to save. This part of his purpose was rendered necessary, not by any limitation in the efficacy of the atonement, not by his unwillingness to apply its efficacy to the whole number of mankind, but by the unwillingness of men to avail themselves of the Savior provided for them. Here, it is claimed, election comes in to secure the willingness of a part of those whose unwillingness, with all that it implies, is the one obstacle in the way of their being saved. This election is represented as made in the exercise of infinite knowledge concerning all that is right. It was prompted by the same infinite love to mankind that gave the Son of God to die for the whole world. Therefore it included all whom infinite power, wisdom, justice, and love would enable God to make willing in view of all the considerations that can and should enter into the question. The object of the election was to secure salvation, not to hinder or restrict it; and—the argument continues—as it was rendered necessary only by man's unwillingness to accept the provision made for him, if men suppose it certain or possible that any will of themselves accept the Savior, they are bound to suppose that the election has not shut such persons out, has not diminished any prospect or possibility of being saved which they may be thought to have irrespective of God's choice. The election was made not as an arbitrary intrusion into the divine governmental order, but with a perfect view and recognition of all the principles which God

has established for the administration of his government: of his promise to hear prayer, to give the Holy Spirit to those who ask, to pour out his influences on all flesh, to prosper the right use of appropriate means, and to bless all wise and faithful efforts of men for the salvation of their fellow-men.

The view above given is in general the Calvinistic view; though different schools of Calvinist theologians differ in their shading of certain points on this subject; and it is probably the fact that the presentation of the whole doctrine in preaching at the present day is with less emphasis and stress than formerly on the points which are distinctive from Arminianism. Arminianism—at least as now held—equally with Calvinism, affirms the Divine foreknowledge and fore-ordination, and that neither precedes the other in time—both being eternal. But while Calvinism makes foreknowledge dependent in its nature on fore-ordination, Arminianism tends to make fore-ordination dependent, in the order of nature, on foreknowledge. If the debate were strictly limited to this one issue, it may be doubted whether either side could be conclusively proved as against the other. There are, however, other points of philosophical divergence. See ARMINIUS, CALVINISM, ELECTION, PREDESTINATION, *ante*.

FOREST, a co. in n.w. Pennsylvania, on the Allegheny and Clarion rivers, traversed by the Pittsburgh, Titusville, and Buffalo railroad; 376 sq.m.; pop. '80, 4,385. The surface is hilly, and mostly covered with forests. Co. seat, Tionesta.

FOREST GROVE, a village in Washington co., Oregon, on the Oregon Central railroad, 25 m. w. of Portland. It is the seat of the Pacific university, under the charge of the Congregationalists.

FORESTI, E. FELICE, LL.D., 1793-1858; an Italian scholar, and prætor of Crespino in 1816. In Jan., 1819, he was arrested as one of the Carbonari, and kept in prison 17 years. In 1836, he came to New York, and was for more than 20 years professor of Italian in Columbia college. In 1858, he was appointed consul at Genoa. He published *Twenty Years in the Dungeons of Austria*, an edition of Ollendorf's Italian grammar, and an Italian chrestomathy.

FOREY, ELIE FREDERIC, 1804-72; a French soldier accompanying the first expedition to Algeria in 1844. He became a gen. in 1848, and in 1851 was made commander of the legion of honor in recognition of his firing on the opponents of the *coup d'état*. In 1854, he was at Sebastopol; in 1859, he was the first to inflict disaster upon the Austrians at Montebello, and he was conspicuous in many other engagements. He was with Bazaine in Mexico, where he was military and civil administrator and minister plenipotentiary; was made a marshal in 1863, and given command of a *corps d'armée*.

FORFEITURE has never existed in the United States as a punishment for crime, except in rare instances. Non-forfeiture is a natural sequence of the provision in the federal constitution against attainder. But there are certain offenses in regard to which particular statutes have been enacted by congress exacting the forfeiture of property employed as a means of committing the wrongful act or used in an unlawful transaction; but forfeiture in such cases applies only to the particular property designated, and not generally to chattels or lands, as in the other instances which have been maintained. Thus, laws have been passed from time to time providing that smuggling or importation of goods under fraudulent invoices shall cause a forfeiture either of the entire invoice or of the property wrongfully imported. Acts of piracy entail a forfeiture of the piratical craft and its appurtenances. The same was true of vessels engaged in the slave-trade.

FORKED BEARD, *Phycis furcatus*, and *Raniceps trifurcatus*—the first being the largest—a fish of the cod family found on the w. coast of Europe. In the United States it is called "hake," but is a much better fish than the true hake.

FORKEL, JOHANN NIKOLAUS, 1749-1818; a native of Saxony, who acquired great reputation as a pianoforte player and a writer on the history and science of music. He was director of music at the university of Göttingen. His most important work is *General History of Music*.

FORLI, a province in n.e. Italy bordering on the Adriatic; 716 sq.m.; pop. '72, 234,090. Near the sea the surface is low and level, but in the w. section it is mountainous. The chief productions are wines, hemp, flax, madder, silk, and anise. There has recently been a considerable advance in manufacturing.

FORLI, MELOZZO DA, 1438-94; an Italian painter, the first to apply foreshortening to the painting of vaulted ceilings. In 1472 he painted "The Ascension," the figure of Christ from which is now in the Quirinal palace.

FORM, in music, denotes both rhythmical structure and distinctive outline. F. holds to harmony a relation like that which, in drawing, outline holds to light, shade, and coloring.

FORM, in philosophy, or IDEA, the term which Plato used to express the reality of a thing; that which makes it what it is, and which continues always the same; in contrast with appearances and objects of sensation that pass away and are altered as they pass. The standard to which these are referred in the mind is a "form" or species, simple and uniform, always the same for each thing, and springing originally from

the supreme mind, the Creator of all things, who has made each and every thing according to the idea or form of it pre-existing in his mind. Aristotle also used the word *form* as expressing the essence of a thing. Lord Bacon said: "When we speak of *forms*, we understand the laws and modes of action which regulate and constitute any simple nature, such as heat, light, weight, in all kinds of matter susceptible of them; so that the form of heat and the law of heat, or the form of light and the law of light, are the same thing." "The form of a thing is the very thing itself; and the thing no otherwise differs from the form than as the apparent differs from the existent, the outward from the inward, or that which is considered in relation to man from that which is considered in relation to the universe." Sir William Hamilton called the theory of substantial *forms* "the theory of qualities viewed as entities conjoined with matter, and not as mere dispositions or modifications of it." Dr. McCosh says that "the distinction between matter and form was first drawn by Aristotle, who represented every thing as having in itself both matter and form; but that a new meaning was attached to it by Kant, who supposed that the mind supplies from its own furniture a form for the matter presented to it from without. But this doctrine, if carried out, would sap the foundations of all knowledge; for if the mind may contribute from its own stores one element, why not another? Why not all elements? In fact, Kant did by this distinction open the way to all those later speculations which represent the whole universe as being an ideal construction. The truth is, that the mind does not of itself impose the form on the object, but is simply so constituted as to know what is in the object."

FORMES, KARL JEAN, b. Baden, 1818; known as a basso singer, with a voice remarkable for depth and compass. He was compelled to leave Vienna on account of his revolutionary opinions, and went to London, where he was considered to be unsurpassed as a singer. In 1857, Formes came to America, which country and its people he greatly liked, and appeared in New York for several seasons. In later years his voice failed, and he attempted drama in London, but with no great success. His capacity of various expression in singing was recognized as the natural effect of an unusually broad intelligence.

FORMIA (formerly MOLA GAETA or CASTELMOLA), a t. of Italy, in the province of Caserta, near the ancient Via Appia, on the innermost recess of the gulf of Gaeta; pop. '71, 9,151. The surrounding country is occupied with vineyards, olive plantations, and fruit gardens. Formia occupies the site of the ancient Formiæ, said to have been founded by the Tyrrhenians. At an early period it received the Roman franchise and became a municipium. Villas were built near it by many of the noble Romans; and in the grounds of the villa Caposele there are ruins which are thought by some to have been the baths of the villa of Cicero. The villa Caposele was at one time one of the residences of the kings of Naples. The vine of the Formian hills produced excellent wine in the time of Horace.

FORMICATION, a peculiar sensation of the skin, such as might be produced by the creeping of multitudes of ants (*formica*) or other small insects. It is akin to the awakening from numbness, or of a limb being "asleep." It is sometimes a symptom of cerebral or spinal disease.

FORMOSA (*ante*), a Portuguese word meaning "formly," "beautiful," the Chinese name Tai-wan means "Great Terrace." F. is an island, lying off the coast of China, and is intersected by a range of volcanic mountains, running from n. to south. The western half only was formerly claimed by China, and in the native and Jesuit maps of the Chinese empire only that half was marked as Chinese territory. The eastern half, or aboriginal Formosa, was, from the 15th c., considered by the Japanese as part of their territory, as were the islands lying immediately adjacent. (See the works of Charlevoix and De Mailla.) The Dutch occupied a point called Zeelandia, a fort and town, from 1624 to 1662; and for this privilege paid tribute to the Japanese rulers in Yedo. When the persecution broke out in Japan, large numbers of native converts fled to Formosa and dwelt with the Dutch. In 1662, Koku-sen-ya ("Coxinga" of the Jesuits), a Japanese pagan half-breed, fitted out an expedition, attacked the Dutch forts, and slaughtered the traders, the missionaries, their families, and many of the Japanese converts. In Mar., 1867, the American brig *Rover* was driven ashore on the Vele-rete rocks, off southern Formosa, and the captain, his wife and crew were killed by the natives. In June, 1867, com. Bell having received instructions from Washington, sailed to Formosa with the *Hartford* and *Wyoming*, landed a force of 181 men, and attacked the Botau savages. The Americans were driven off with loss; the Chinese disavowing all responsibility over eastern Formosa. In Sept., 1867, gen. Le Gendre, U. S. consul at Amoy, visited Tokitok, the acknowledged head of the 18 savage tribes of the coast, and obtained a promise that the lives of shipwrecked Americans and Europeans should be respected. In Dec., 1871, a large fishing vessel from the Miyako group of islands lying e. of Formosa, was wrecked off the Botau territory; 54 of the crew were killed, and some, it was said, eaten by the Botans. The survivors who escaped reported the affair to the magistrates of Riu Kiu (Loo Choo), who begged the Japanese government for redress. June 8, 1874, the Japanese forces under general Saigo occupied a point at Laing Kioa bay, and for six months the 1300 troops remained in Formosa, making roads,

and chastising the savages, the object of the Japanese being to reduce the country to order, survey the coast, and erect light-houses. The Peking government not relishing the bold action of their neighbors, and stirred up by foreign intrigue, demanded the withdrawal of the troops and menaced hostilities; but Okubo, the mikado's envoy in Peking, remained firm in his demand that China should reclaim and govern eastern Formosa, and pay the expenses of the Japanese occupation. The Chinese agreed, and paid 700,000 taels, Dec. 1, and gen. Saigo and the troops disembarked on the 3d. The loss of the Japanese by disease and in battle was 700 men. Japan by this expedition to Formosa spent \$5,000,000 in the interests of civilization. The Chinese have since attempted to occupy and rule the savages of e. Formosa, with what success remains to be seen.

FORMOSUS, d. 896, the successor of Stephen V. as pope, first appears in history when as bishop of Porto, he was sent on an embassy to the Bulgarians. Having afterwards sided with the German faction against John VIII., he was excommunicated, and compelled to take an oath never to return to Rome, or again to assume his priestly functions. From this oath he was absolved by Martin II., the successor of John VIII., and restored to his dignities; and on the death of Stephen V., in 891, he was chosen pope. The Italian faction had chosen Sergius; and the election of Formosus, which was in opposition to an old rule against the translation of bishops from one see to another, could not be confirmed without violence, but was rendered secure for a time by the success of the arms of Arnulf of Germany. After the withdrawal of Arnulf, Formosus was compelled to grant the imperial crown to Lambert, son of Guido of Italy; but this act did not pacify the Italian faction, and Formosus was released from very hard straits only by the arrival of Arnulf, who captured the city in the end of 895. In the following year Arnulf was crowned emperor by Formosus; but before the death of the latter in May, the excesses of Arnulf and his soldiers had begun to create a strong opposition to the German power amongst all parties in Italy. By Stephen VI. the body of Formosus was disinterred, and treated with contumely as that of a usurper of the papal throne; but Theodoros II. restored it to Christian burial, and at a council presided over by John IX., the pontificate of Formosus was declared valid and all his acts confirmed.

FORNARINA, LA, the daughter of a baker in Rome, the model of many figures by Raphael, and represented to have been his mistress. Raphael saw her washing her feet in the river, fell in love with her, and made her name immortal.

FORNEY, JOHN WEISS, b. in Penn., 1817; a printer and journalist. In 1837, he was editor of the *Lancaster Intelligencer*. In 1848, and for some years afterwards, he edited the *Pennsylvanian*, a democratic paper in Philadelphia. In 1851, he was clerk of the house of representatives (in congress), and was re-elected in 1853. About the same time he was editor of the *Union*, in Washington. When the rebellion began, he became a zealous republican, and edited the *Press* of Philadelphia, and *Chronicle*, Washington. In 1861, he was clerk of the senate. At present (1880), he is the editor of *Progress*, a weekly literary paper published in Philadelphia. He is the author of *Anecdotes of Public Men*; *Letters on Europe*; and the *Life of Gen. W. S. Hancock*. In 1880, he returned to the support of the democratic party.

FORREST, EDWIN, 1806-73; b. Philadelphia, of Scotch and German descent. He made his first appearance on the stage, Nov. 27, 1820, as "Young Norval" in the play of *Douglas*. By diligence and close study he rose in the profession, and in 1826, at the Park theater, New York, made a decided triumph in "Othello." Thenceforward his career was one of uninterrupted success in this country and in England. While in the latter country in 1837 he married Catherine, the daughter of John Sinclair, the singer. She was afterwards divorced from him, and the trial in the case was one of the most famous in the country. His last professional engagement was in New York in 1871. He died from apoplexy after only half an hour's illness. In his will he left a large portion of the ample estate which he had amassed in his profession, to establish a home for aged and destitute actors. Forrest was essentially a melodramatic actor. His robust physique and still more robust voice made the assumption of sentimental parts almost impossible. In "Richard III.," "Lear," "Coriolanus," and, "Othello," he was conspicuously good. He was better still in "Jack Cade," "Metamora," "Spartacus," "Damon," and characters of that range. Much undeserved odium has been cast upon him as being in some degree responsible for the Astor place riot in New York. That outbreak—ostensibly in favor of F. against his great English rival Macready—was one of the episodes of the political native American movement of the period. F. was of a disposition ardent, impetuous, and frank; and his scholarship in the range of his profession was good. He gathered a splendid library, in which the Shakespearean collection was reputed the finest in the world.

FORREST, URIAH, 1756-1805; a lieutenant-col. in the Maryland line in the revolution, wounded at Germantown. He was a member of congress in 1786, afterwards in both houses of the state legislature, major-gen. of militia, and clerk of the circuit court of the district of Columbia.

FORSKÄL, PETER, 1736-63; b. Sweden; educated at Göttingen, he early displayed aptitude for studies in natural history, and attracted the attention of Linnæus, who

presented him to Frederick V. of Denmark. That monarch gave him a professorship at Copenhagen, and also sent him with Carsten Niebuhr on an expedition to Arabia and Egypt. Seized with an attack of the plague, he died at Jerim in Arabia, leaving his friend and companion in charge of his MSS., of which the latter published, in 1775 *Descriptiones Animalium, Avium, Amphibiorum, Piscium, Insectorum, Vermium, quæ ir itin. Orient, observavit Petrus Forskal*. In the same year appeared also an account of the plants of Arabia Felix and of Lower Egypt, under the title of *Ægyptiaco-Arabica*, important as containing the first discussion of the relation of vegetation to climate.

FORST, FORSTA, or FORSTE, a t. in Brandenburg, Prussia, circle of Sorau, on the Neisse, 44 m. s.e. of Frankfort-on-the-Oder. Its principal industries are tanning and the manufacture of woolen cloth; it has also a considerable cattle trade. Near the town are the ruins of an old castle. Forst was founded in the 13th c., and was burnt by the Hussites in 1430. From 1667 it belonged to the dukes of Sachsen-Merseburg, from 1740 to the palatinate of Saxony, and from 1815 to Prussia. Pop. '75 (including Altforst, united to it in 1874), 14,148.

FÖRSTER, ERNEST JOACHIM, b. 1800; a German art critic and painter, brother of Frederick, the historian and poet. Ernest at first applied himself to the study of theology and philosophy, but soon devoting himself to art, entered the studio of Peter Cornelius at Munich. He was employed in painting the frescoes in the Aula at Bonn, and those of the glyptothek and the arcades at Munich; but his reputation rests chiefly on his discovery of several ancient pictures, and on his works in elucidation of the history of art. His greatest discovery was the frescoes of Avanzo, which date as far back as 1376, in the chapel of San Giorgio at Padua. Among his works are excellent guide-books to Munich, Italy, and Germany; *Studies relating to the History of Modern Art; Letters on Painting; History of German Art; Monuments of German Architecture, Sculpture, and Painting*; and a *History of Italian Art*. He has written a life of Jean Paul Richter, and edited several of his works.

FÖRSTER, FRIEDRICH, 1791-1868; a German historian, brother of Ernest Joachim, the painter. After receiving his early education in the gymnasium at Altenburg, he studied theology at Jena, but subsequently devoted his attention for a time chiefly to archaeology and the history of art. On the uprising of Prussia against France in 1813, he joined the army, where he soon attained the rank of capt. At the close of the war he was appointed professor in the school of engineering and artillery in Berlin, but on account of certain democratic writings he was dismissed from that office in 1817. He then became connected with various literary journals, and in 1830 undertook with his brother an art tour in Italy. Shortly after his return he received an appointment in the royal museum of Berlin, with the title of court counselor. Forster was the founder and secretary of the scientific art union of Berlin.

FORSTER, WILLIAM, 1784-1854; b. England; married a sister of Thomas Powell Buxton; became a preacher in the society of Friends, and labored as such in the United States, England, and France. In 1846, he was commissioned by the Quaker yearly meeting in London to present an address on slavery and the slave trade to rulers of Christian nations, in the prosecution of which he had interviews with nearly all the monarchs of Europe, with the president of the United States and a number of the governors of southern states.

FORSYTH, a co. in n. Georgia on the Chattahoochee river; 250 sq.m.; pop. '80, 10,559—1487 colored. The surface is hilly, and in some places mountainous. The soil is fertile. There are valuable minerals, such as copper, silver, and gold. Co. seat, Cumming.

FORSYTH, a co. in n.w. North Carolina; on the Yadkin river; 350 sq.m.; pop. '80, 18,070—4,628 colored. The surface is rough, and the soil fertile. Productions, corn, wheat, oats, potatoes, etc. Co. seat, Winston.

FORSYTH, JOHN, 1781-1841; b. Va.; graduated at Princeton, and admitted to the bar at Augusta, Ga., in 1802. In 1808, he was state attorney general; in 1812, member of congress, and in 1818, U. S. senator. In 1820-23 he was minister to Spain, and the negotiator of the treaty for the annexation of Florida to the United States. He was again in congress both as representative and senator, and in 1827 was governor of Georgia. Under Jackson and Van Buren he was secretary of state.

FORSYTHIA, a genus of shrubs of the order *oleaceæ*. The *F. viridissima* and *F. suspensa*, small Chinese shrubs, now commonly cultivated, are hardy, and noticeable for their yellow flowers, which appear before the leaves in the spring. The name is in honor of a distinguished Scotch gardener, William Forsyth.

FORTALEZA, or VILA DO FORTE (CEARÁ, ante), a t. of Brazil in the province and on the river Ceará, 3° 42' s., and 38° 30' west. There is an old and a new town with regular and well-paved streets. There is a good export trade in coffee, cotton, and sugar. Pop. about 20,000.

FORT ANN, a village in Washington co., N. Y., on the Champlain canal, and the Rensselaer and Saratoga railroad; 67 m. n. of Albany; pop. of township '80, 3,262. There is an English fort here built in 1709, taken from the Americans in 1780. The

village is on the shore of lake George, and is a place of considerable business as well as a resort for travelers.

FORT ATKINSON, a village in Jefferson co., Wis., on the Rock river and the Chicago and Northwestern railroad; pop. 2,010. It contains a number of manufactories, and has two weekly newspapers.

FORT BEND, a co. in s.e. Texas on the Brazos river, traversed by the Galveston, Harrisburg, and San Antonio railroad; 920 sq. m.; pop. '70, 7,114—5,510 colored. The surface is level, with prairies and live-oak forests; soil, fertile. Cattle-raising is the chief occupation. Co. seat, Richmond.

FORT DODGE, a city in Webster co., Iowa, on the Des Moines river, at the junction of the Iowa division of the Illinois Central with the Des Moines and Fort Dodge railroad; pop. '75, 3,537. The river affords power for a large number of manufactories. There are a court-house, seven or eight churches, and a number of public schools. In the vicinity are quarries of coal, building-stone, and gypsum.

FORT DONELSON and **FORT HENRY**, the first on the Tennessee and the last on the Cumberland river, near the line between Tennessee and Kentucky, about 12 m. apart. The works were built in 1861 by the confederates, and strongly manned. Early in 1862 the union army undertook their capture. Feb. 2, a naval force, followed by land troops, left Cairo, arriving the next morning before Fort Henry, which was defended by 3,000 men commanded by gen. Tilghman. On the 6th a combined attack was made, the naval force commanded by commodore A. H. Foote, and the land force by brig. gen. U. S. Grant. The fort was taken by the naval forces in an hour, some time before the land troops arrived. On the 12th, Grant moved upon Fort Donelson, which had received large reinforcements, including nearly all the garrison of Fort Henry, and the commands of gens. Pillow, Buckner, and Floyd. On the 13th, Grant began a cannonade. The next day an attack was made by the fleet, but within two hours every gun-boat was disabled, 54 men were killed, and the fleet was compelled to withdraw. The confederates, hoping to secure a retreat towards Nashville, attempted a surprise on the morning of the 15th. They were promptly met, and an indecisive action continued until 3 p.m. At that hour Grant ordered a general advance, drove the confederates within their own lines, and gained a position within their works. About 2,000 on each side were killed or wounded in the course of the day. Grant prepared for a general assault the next morning, but the confederate leaders concluded to surrender. During the night, Floyd with about 1500 men, Forrest with a few hundred, and Pillow and his staff, escaped, leaving Buckner in command. On the morning of the 16th, Buckner sent to Grant asking the appointment of commissioners to settle upon the terms of capitulation and for an armistice until the next day at noon. Grant returned on the instant the now famous reply: "No terms other than unconditional surrender can be accepted. I propose to move immediately upon your works." Buckner had no alternative, and at once surrendered the fort with 10,000 men, 48 guns, and a great quantity of ammunition. The terms of Grant's answer were universally recognized by the loyal public as a vivid expression of their feelings; and from the similarity of the initial letters of his name (Ulysses Simpson) he came to be called "Unconditional Surrender Grant."

FORT DUQUESNE. See **PITTSBURG**.

FORT EDWARD, a village and township in Washington co., N. Y., on the Hudson river, the Champlain canal, and the Rensselaer and Saratoga railroad; pop. of village '75, 3,492. A dam across the Hudson here affords great water-power. The village contains several manufactories, has two newspapers, and it is the seat of the Fort Edward collegiate institute, an institution free to both sexes for higher education. There are some remains of a fort built in 1709, and of another built in 1755. It was a place of much importance in the French and Indian war, and was repeatedly occupied by opposing forces in the revolution. The name was given in honor of Edward, duke of York.

FORTESCUE, **CHICHESTER SAMUEL PARKINSON**, b. England, 1823; graduated at Oxford. He has been a member of parliament for Louth since 1847, acting with the liberals. He has been a lord of the treasury, under-secretary of state for the colonies, chief secretary of Ireland, privy counselor, member of Mr. Gladstone's cabinet in 1868, and in 1871 president of the board of trade.

FORTESCUE, **SIR JOHN** (*ante*), an English lawyer in the time of Henry VI., descended from an ancient family in Devonshire. He was educated at Exeter college, Oxford. During the reign of Henry VI. he was three times appointed one of the governors of Lincoln's Inn. In 1441, he was a king's sergeant at law, and in the following year chief-justice of the king's bench. As a judge, Fortescue is highly commended for his wisdom, gravity, and uprightness; and he seems to have enjoyed great favor with the king, who is said to have given him substantial proofs of esteem and regard. He held his office during the remainder of the reign of Henry VI., to whom he steadily adhered; and having faithfully served that unfortunate monarch in all his troubles, he was attainted of treason in the first parliament of Edward IV. When Henry subsequently fled into Scotland, he is supposed to have appointed Fortescue, who appears to have accompanied him in his flight, chancellor of England. In 1463, Fortescue accompanied queen Margaret and her court in their exile on the continent, and returned

with them afterwards to England. During their wanderings abroad, the chancellor wrote, for the instruction of the young prince Edward, his celebrated work, *De laudibus legum Angliæ*, a masterly eulogy of the laws of England. On the defeat of the Lancastrian party he made his submission to Edward IV., from whom he received a general pardon dated Westminster, Oct. 13, 1471. He died at an advanced age, but the date has not been ascertained. A valuable and learned work by F. written in English, was published in 1714, discussing the difference between an absolute and limited monarchy, as regards the English constitution. Of Fortescue's other writings, which were numerous, the most important are: *Genealogy of the House of Lancaster*; *Genealogia Regum Scotia*; *A Dialogue between Understanding and Faith*; and *A Prayer Book which savors much of the Times we live in*.

FORT FISHER, an earthwork in North Carolina, on the peninsula between the ocean and Cape Fear river, defending the entrance to the port of Wilmington. In the last year of the war of the rebellion this was the only port open to the confederates, and it became a matter of importance to the unionists to close it. To effect this purpose, a formidable fleet left Hampton roads Dec. 13, 1864, and arrived off Federal point on the 15th. On the 23d, gen. Benjamin F. Butler, who was chief in command, prepared to attack, and did so the next day. One of his reliances was on a hulk laden with 215 tons of powder, to be exploded as near to the fort as it could be brought. This hulk was brought to a point 600 ft. from the shore and about 3,000 ft. from the fort, and fired. The explosion did no appreciable damage to the fort. The fleet then opened fire, and in a little over an hour the guns of the fort were silenced. On the 25th the bombardment was renewed, and under cover of it a reconnoitering force went within 150 yards of the fort, but an assault was deemed inadvisable, and the troops were re-embarked, and returned to James river. The fleet, however, remained, and Jan. 2d and 3d, 1865, 8,000 men were assembled at Bermuda Hundred, under command of gen. A. H. Terry. Embarking on the 4th and 5th, they landed on the 13th under cover of the fire of the vessels. There was hard fighting on the 14th and 15th, resulting in the capture of the fort, with over 2,000 prisoners and 169 guns. The union loss was 110 killed and 536 wounded. The confederates then blew up their remaining works, and the control of the mouth of Cape Fear river passed into union hands.

FORT GAINES, the seat of justice of Clay co., Ga., on the Chattahoochee river and a branch of the Southwestern railroad, at the head of steamboat navigation on the river; pop. 70, 758. It is an important shipping place for cotton.

FORT HOWARD, a city in Brown co., Wis., on Fox river a mile from the mouth, and on the Chicago and Northwestern railroad opposite the city of Green Bay; pop. 3,610. There are several manufactories, but lumber is the principal article of trade.

FORT JACKSON, on the Mississippi, 78 m. below New Orleans, was built 1824-32, but enlarged and repaired in 1841. This and fort St. Philip, on the opposite bank, defend the city from maritime attack. After the passage of the South Carolina ordinance of secession, the state authorities of Louisiana seized these forts, strongly fortified them, and stationed a fleet above. Admiral Farragut, having been appointed by the United States government in command of a fleet for their recapture, sailed from Hampton roads on the *Hartford*, and having reached Ship island, April 20, 1862, called a council of war, and issued his general order to the fleet. In accordance with this, the whole fleet, April 24, at 2 A.M., moved up the river in two columns, and passed successfully, in the face of a tremendous fire from the forts and confederate vessels. After the destruction of the vessels above, and the surrender of the city, the forts were given up.

FORT LEE, a small village in Hudson co., N. J., on the w. bank of the Hudson river, opposite New York. It is a favorite place of resort in the summer for strangers and residents of the metropolis, as it is situated at the base of the palisades, which rise from the river, a perpendicular wall of rock on the w. side, from 150 to 250 ft. high, and 10 m. in extent. This mass of rock furnishes the paving stones for the streets of New York and other cities. After the battle of White Plains, in the revolution, gen. Washington crossed the Hudson river and took a position near Fort Lee. At the same time the British were getting possession of Fort Washington (on the e. side of the river, directly opposite Fort Lee), and Cornwallis prepared with a force of 6,000 men to secure Fort Lee. Washington's force was unequal to a defense, and he retreated southward until he had passed the Delaware, abandoning large amounts of military stores.

FORT MADISON, the seat of justice of Lee co., Iowa; on the Mississippi river, and the Burlington and South-western, and the Burlington and Keokuk railroads; pop. 4,305. The state prison is here. The manufacture of farm implements is the principal business.

FORT MONROE, at Old Point Comfort, on the n. side of the channel, defending, with fort Wool, a mile distant on the s., Hampton roads, Norfolk, and the Gosport navy-yard. This structure is more properly a fortress, containing, besides barracks for soldiers and storehouses, also a United States school of artillery, arsenal, chapel, and other buildings, and covers 80 acres. It is an irregular hexagon, surrounded by a tide-water ditch 8 ft. deep at high-water. It was commenced in 1817, designed to mount 371 guns, has cost nearly \$3,000,000, and is not yet completed. The fortress was designed, at the close of the war of 1812-14, by gen. Simon Bernard, an eminent foreign engineer.

who planned the works on a scale of great magnitude, after the model of European forts, but no other fortification in this country is constructed like it.

FORT MOULTRIE, on Sullivan's island, at the entrance of Charleston harbor, so named in honor of col. William Moultrie, who, in command of South Carolina troops, June 28, 1776, successfully repelled the attack of the British fleet under sir Peter Parker. It was subsequently rebuilt, and was occupied by maj. Robert Anderson at the commencement of the civil war in 1860, who, abandoning it Dec. 26, removed his forces to fort Sumter.

FORT SCOTT, a city in Bourbon co., Kan., on the Marmiton river, and the Missouri, Kansas and Texas railroad: pop. 4,174. It is one of the most important towns in that part of the state. The mining and shipping of bituminous coal is the leading business. In 1842, it was a military post.

FORT SMITH, a city in Sebastian co., Ark., near the w. boundary of the state, on the Little Rock and Fort Smith railroad, at the junction of the Arkansas and the Poteau rivers; pop. 2,227. It is a flourishing place, with considerable trade. The U. S. district court having jurisdiction over the adjoining Indian territory holds its sessions in this place.

FORT SUMTER, on an artificial island at the entrance of the harbor of Charleston, S. C., $\frac{3}{4}$ m. from the city, and 1 m. from fort Moultrie. It was begun 1829, but being unfinished, maj. Robert Anderson, before the outbreak of the rebellion in 1860, occupied fort Moultrie with a small garrison of 75 men. On learning that the secessionists of South Carolina designed to take this and other forts in the harbor, he transferred his forces, Dec. 26, to Fort Sumter. An attempt to supply it with provisions and troops by steamship from New York, early in 1861, having failed, and powerful batteries commanding it at every point having been erected, gen. Beauregard, with a strong rebel force, demanded, April 11, an immediate surrender, maj. Anderson agreed to capitulate if not reinforced by the 15. Beauregard commenced its bombardment on the 12, and as the provisions and ammunition were nearly exhausted, the fort was evacuated on the 14, the garrison marching out with the honors of war. The fort was then strongly garrisoned by the rebels, and though bombarded by a fleet under admiral Du Pont, and assaulted by batteries on Morris island, it was not taken till Charleston was abandoned in Feb., 1865.

FORTS OF THE UNITED STATES. The following list comprises the military posts, garrisons, and stations occupied by troops of the United States on the 31st of Oct., 1879:

SEA AND GULF COASTS.

Fort Sullivan.....	Eastport, Me.	Fort Macon.....	Beaufort, N. C.
Fort Knox.....	Bucksport, Me.	Fort Caswell.....	Smithville, N. C.
Fort Popham.....	Parker's Head, Me.	Fort Johnston.....	Smithville, N. C.
Fort Georges.....	Portland, Me.	Fort Sumter.....	Charleston, S. C.
Fort Preble.....	Portland, Me.	Fort Moultrie.....	Charleston, S. C.
Fort Scammel.....	Portland, Me.	Fort Johnson.....	Charleston, S. C.
Portland Head battery.....	Portland, Me.	Castle Pinckney.....	Charleston, S. C.
Fort McClary.....	Kittery, Me.	Charleston barracks.....	Charleston, S. C.
Fort Constitution.....	Newcastle, N. H.	Fort Jackson.....	Savannah, Ga.
Jerry's Point battery.....	Portsmouth, N. H.	Fort Pulaski.....	Savannah, Ga.
Fort Lee.....	Salem, Mass.	Oglethorpe barracks.....	Savannah, Ga.
Fort Independence.....	Boston, Mass.	Fort Clinch.....	Fernandina, Fla.
Fort Warren.....	Boston, Mass.	Fort Marion.....	St. Augustine, Fla.
Fort Winthrop.....	Boston, Mass.	St. Francis barracks.....	St. Augustine, Fla.
Long Point batteries.....	Provincetown, Mass.	Fort Jefferson.....	Key West, Fla.
Long Island battery.....	Provincetown, Mass.	Fort Taylor.....	Key West, Fla.
Fort Andrew.....	Plymouth, Mass.	Key West barracks.....	Key West, Fla.
Fort Standish.....	Plymouth, Mass.	Fort Brooke.....	Tampa, Fla.
Fort Phoenix.....	Fairhaven, Mass.	Fort Pickens.....	Warrington, Fla.
Clark's Point fort.....	New Bedford, Mass.	Fort Barrancas.....	Warrington, Fla.
Fort Adams.....	Newport, R. I.	Fort McKee.....	Warrington, Fla.
Fort Wolcott.....	Newport, R. I.	Fort Gaines.....	Mobile, Ala.
Dutch Island fort.....	Jamestown, R. I.	Fort Morgan.....	Mobile, Ala.
Fort Griswold.....	New London, Conn.	Ship Island.....	Mississippi City, Miss.
Fort Trumbull.....	New London, Conn.	Fort Macomb.....	Lake Borgne, La.
David's Island.....	New Rochelle, N. Y.	Fort Livingston.....	Barataria Bay, La.
Fort Schuyler.....	Long Island, N. Y.	Battery Benvenue.....	New Orleans, La.
Willet's Point.....	Long Island, N. Y.	Dupre's tower.....	New Orleans, La.
Fort Columbus.....	New York harbor.	Jackson barracks.....	New Orleans, La.
Fort Wood.....	New York harbor.	Fort Jackson.....	Below New Orleans, La.
Fort Wadsworth.....	Narrows, N. Y. harbor.	Fort Pike.....	Below New Orleans, La.
Fort Hamilton.....	Narrows, N. Y. harbor.	Fort St. Philip.....	Below New Orleans, La.
Fort Lafayette.....	Narrows, N. Y. harbor.	Fort San Diego.....	Corpus Christi, Tex.
Sandy Hook fort.....	Sandy Hook, N. J.	San Diego.....	San Diego, Cal.
Finu's Point battery.....	Salem, N. J.	Alcatraz island.....	San Francisco, Cal.
Fort Mifflin.....	Philadelphia, Pa.	Angel island.....	San Francisco, Cal.
Fort Delaware.....	Delaware City, Del.	Fort Point.....	San Francisco, Cal.
Fort McHenry.....	Baltimore, Md.	Lime Point fort.....	San Francisco, Cal.
Lazaretto Point fort.....	Baltimore, Md.	Point San José.....	San Francisco, Cal.
Fort Carroll.....	Baltimore, Md.	Presidio.....	San Francisco, Cal.
Fort Washington.....	Fort Washington, Md.	Yerba Buena island.....	San Francisco, Cal.
Fort Foote.....	Opp. Alexandria, Va.	Fort Stevens.....	Astoria, Oreg.
Fort Monroe.....	Old Point Comfort, Va.	Fort Canby.....	near Astoria, W. T.
Fort Wool.....	Old Point Comfort, Va.	Fort Townsend.....	Port Townsend, W. T.
Fort Whipple.....	Georgetown, Va.	Vancouver barracks.....	Vancouver, W. T.
Washington arsenal.....	Washington, D. C.		

FRONTIER STATIONS.

Fort Montgomery.....	Rouse Point, N. Y.
Plattsburg barracks.....	Plattsburg, N. Y.
Madison barracks.....	Sackett's Harbor, N. Y.
Fort Ontario.....	Oswego, N. Y.
Fort Niagara.....	Lewiston, N. Y.
Fort Porter.....	Buffalo, N. Y.
Fort Wayne.....	Detroit, Mich.
Fort Gratiot.....	Gratiot, Mich.
Fort Brady.....	Sault Ste. Marie, Mich.

Fort Bliss.....	El Paso, Tex.
Fort Davis.....	Presidio co, Tex.
Fort San Felipe.....	Del Rio, Tex.
Fort Duncan.....	Eagle Pass, Tex.
Fort Clark.....	Brackettsville, Tex.
Fort McIntosh.....	Laredo, Tex.
Fort Ringgold.....	Rio Grande City, Tex.
Fort Brown.....	Brownsville, Tex.

INTERIOR STATIONS.

Kennebec arsenal.....	Augusta, Me.
Springfield arsenal.....	Springfield, Mass.
Watertown arsenal.....	Watertown, Mass.
New York arsenal.....	New York City.
Watervleit arsenal.....	Watervleit, N. Y.
U. S. Military Academy.....	West Point, N. Y.
Frankford arsenal.....	Philadelphia, Penn.
Allegheny arsenal.....	Pittsburg, Penn.
Carlisle barracks.....	Carlisle, Penn.
Pikesville arsenal.....	Pikesville, Md.
Mt. Vernon barracks.....	Mt. Vernon, Ala.
Augusta arsenal.....	Augusta, Ga.
Atlanta.....	Atlanta, Ga.
Rock Island armory.....	Rock Island, Ill.
Fort Snelling.....	Fort Snelling, Minn.
Newport barracks.....	Newport, Ky.
Little Rock barracks.....	Little Rock, Ark.
Indianapolis arsenal.....	Indianapolis, Ind.
Columbus barracks.....	Columbus, O.
Jefferson barracks.....	Jefferson City, Mo.
St. Louis barracks.....	St. Louis, Mo.
Fort Leavenworth.....	Fort Leavenworth, Kan.
Military prison.....	Fort Leavenworth, Kan.
Fort Dodge.....	Dodge City, Kan.
Fort Hays.....	Hays City, Kan.
Fort Riley.....	Fort Riley, Kan.
Fort Wallace.....	Fort Wallace, Kan.
Fort Hartstuff.....	Calamus, Neb.
Fort McPherson.....	Cottonwood Springs, Neb.
Fort Omaha.....	Omaha, Neb.
Fort Sidney.....	Sidney, Neb.
Fort Robinson.....	Fort Robinson, Neb.
North Platte station.....	North Platte, Neb.
Fort Garland.....	Fort Garland, Col.
Fort Lewis.....	Pagosa Springs, Col.
Fort Lyon.....	Fort Lyon, Col.
Fort Halleck.....	Fort Halleck, Nev.
Fort McDermit.....	Fort McDermit, Nev.
Fort Harney.....	Camp Harney, Or.
Fort Klamath.....	Linkville, Or.
Benicia arsenal.....	Benicia, Cal.
Benicia barracks.....	Benicia, Cal.
Fort Bidwell.....	Fort Bidwell, Cal.
Fort Yuma.....	Fort Yuma, Cal.
San Antonio arsenal.....	San Antonio, Tex.
Fort Concho.....	Fort Concho, Tex.
Fort Elliot.....	Fort Elliot, Tex.
Fort Griffin.....	Fort Griffin, Tex.
Fort McKavett.....	Fort McKavett, Tex.
Fort Stockton.....	Fort Stockton, Tex.
Fort Gibson.....	Fort Gibson, Ind. Ter.
Fort Sill.....	Fort Sill, Ind. Ter.
Fort Supply.....	Fort Supply, Ind. Ter.
Camp on Canadian Riv.....	Indian Territory.
Fort Bayard.....	Fort Bayard, N. Mex.

Fort Gray.....	Fort Gray, N. Mex.
Fort Marcy.....	Fort Marcy, N. Mex.
Fort McKee.....	Aleman, N. Mex.
Fort Selden.....	Selden, N. Mex.
Fort Stanton.....	Fort Stanton, N. Mex.
Fort Union.....	Fort Union, N. Mex.
Fort Wingate.....	Fort Wingate, N. Mex.
Fort Lowell.....	Tucson, Ariz.
Camp Huachuca.....	Tucson, Ariz.
Fort Bowie.....	Apache Pass, Ariz.
Camp A. Rucker.....	Fort Bowie, Ariz.
Fort Mojave.....	Mojave City, Ariz.
Fort Grant.....	Fort Grant, Ariz.
Fort Apache.....	Allen, Ariz.
Whipple barracks.....	Prescott, Ariz.
Fort Verde.....	Fort Verde, Ariz.
Fort McDowell.....	Fort McDowell, Ariz.
Fort Sisseton.....	Fort Sisseton, Dak.
Fort Pembina.....	Pembina, Dak.
Fort Meade.....	Fort Meade, Dak.
Fort Hale.....	Fort Hale, Dak.
Fort Buford.....	Fort Buford, Dak.
Fort Bennett.....	Fort Bennett, Dak.
Fort Abraham Lincoln.....	Fort A. Lincoln, Dak.
Fort Randall.....	Fort Randall, Dak.
Fort Sully.....	Fort Sully, Dak.
Fort Stevenson.....	Fort Stevenson, Dak.
Fort Totten.....	Fort Totten, Dak.
Fort Yates.....	Fort Yates, Dak.
Fort Benton.....	Helena, Mont.
Fort Missoula.....	Mt. Missoula, Mont.
Fort Keogh.....	Fort Keogh, Mont.
Fort Logan.....	Fort Logan, Mont.
Fort Shaw.....	Fort Shaw, Mont.
Fort Custer.....	Fort Custer, Mont.
Fort Ellis.....	Fort Ellis, Mont.
Fort Assiniboine.....	Fort Assiniboine, Mont.
Boise barracks.....	Boise City, Ida.
Fort Hall.....	Blackfoot, Ida.
Fort Lapwai.....	Fort Lapwai, Ida.
Fort Cœur d'Alene.....	Fort Cœur d'Alene, Ida.
Camp Howard.....	Mt. Idaho, Ida.
Fort Douglas.....	Salt Lake City, Utah.
Fort Cameron.....	Beaver City, Utah.
Cheyenne depot.....	Cheyenne City, Wyo.
Fort D. A. Russell.....	Cheyenne City, Wyo.
Fort Sanders.....	Laramie City, Wyo.
Fort Laramie.....	Fort Laramie, Wyo.
Fort McKinney.....	Fort McKinney, Wyo.
Fort Fetterman.....	Fort Fetterman, Wyo.
Fort Fred. Steele.....	Fort F. Steele, Wyo.
Fort Washakie.....	Fort Washakie, Wyo.
Chelan Camp.....	Walla Walla, Wash. T.
Fort Walla Walla.....	Walla Walla, Wash. T.
Fort Colville.....	Fort Colville, Wash. T.

FORTUNATUS, VENANTIUS HONORIUS CLEMENTIANUS, b. 530; Bishop of Poitiers, the chief Latin poet of his time. He studied at Milan and Ravenna, and in 565 he went to France, where he was received with much favor at the court of Sigbert, king of Austrasia, whose marriage with Brunhilda he celebrated in an epithalamium. After residing a year or more at the court of Sigbert, he traveled in various parts of France, visiting persons of distinction, and composing short pieces of poetry on any subject that occurred to him. At Poitiers he visited queen Radegonda, then living there in retirement, and she induced him to remain there indefinitely. Here he met also the famous Gregory, bishop of Tours, and other eminent ecclesiastics. He was elected bishop of Poitiers in 599, and died about 609. His later poems, collected in 11 books, consist of hymns, epitaphs, poetical epistles, and verses in honor of his patroness Radegonda, and of her sister Agnes, abbess of a convent at Poitiers. He also wrote a poem in four books in honor of St. Martin, and several lives of the saints. His prose is stiff and mechanical, but his poetry has an easy rhythmical flow.

FORTUNY, MARIANO, 1839-74; a Spanish painter trained in the academy at Barcelona. In 1856, he gained a prize which entitled him to study in Rome for several years, where, instead of haunting the old galleries, he selected his subjects from common life. In 1859, he went with Prim in the expedition to Morocco. The splendid barbarism of Africa captured his imagination, and he returned with studies which were to make his future fame. His reputation dated from 1866, when he settled in Paris. There he entered

into most profitable business arrangements with the house of Goupil, who introduced his works not only in Europe but in America. In 1869, several of Fortuny's pictures were exhibited in Paris, and in the salon of 1870, Regnault's "Salome," and the "Education of a Prince," by Zamaeois made the names of these three young men known as the founders of a new school—a school that within four years was deprived by death of its illustrious leaders. In 1868, Fortuny married Mademoiselle Madrazo, a sister of Madrazo the artist, and a daughter of the distinguished director of the royal museum of Madrid, himself an artist. The names of Fortuny's best known pictures are "A Spanish Marriage;" "The Serpent-Tamer;" "The Amateur of Prints;" "A Fantasia at Morocco;" "The Sword-Sharpener;" and "The Academicians of Arcadia." F. made hundreds of sketches in Morocco, in Spain, in Italy, and in the environs of Paris. As an etcher he gained a high repute; and many of his etchings have been reproduced. His pictures, produced with deliberate care, brought great prices: "The Spanish Marriage," 75,000 francs; and many of his water colors more than 15,000 francs apiece. "The Serpent-Tamer," bought by A. T. Stewart of New York, is one of the best specimens of his work.

FORT WASHINGTON, an important military post occupying the highest part of the island of Manhattan during the war of independence. It was on a promontory running into the Hudson river, about 10 m. from the southern point of the island, not far from the present 185th street. After the battles of Long Island, Harlem, and White Plains, Washington retreated through New Jersey, leaving a considerable force in fort Washington. Sir William Howe, the British commander, undertook the capture of the fort, which was under command of col. Magaw. Works were erected by the British near Harlem river, to play on the opposite works of the Americans, and, every preparation being made, the garrison were summoned to surrender, on pain of being put to the sword. Col. Magaw replied that he should defend the place to the last extremity. The next morning, the royal army made four attacks. The first, on the n. side, was conducted by gen. Knyphausen; the second, on the e., by gen. Matthews, supported by lord Cornwallis; the third, by lieut.col. Stirling; and the fourth, by lord Percy. Soon after daybreak, Nov. 16, 1776, the cannonading began, and continued with great fury on both sides until noon. The Hessians under the command of gen. Knyphausen then filed into two columns, one of which, led by col. Rhalle, having ascended circuitously to the summit of the hill, penetrated through the advanced works of the Americans, and formed within a hundred yards of the covered way of the front. The other column climbed the hill in a direct line; but in passing through a thick wood, suffered much by a well-directed fire from col. Rawling's regiment of riflemen. The second division made good their landing, and forced the Americans from their rocks and trees up a steep and rugged hill. The third division had to encounter a heavy fire previous to their landing, and then to ascend a woody promontory of very uneven surface; but though the post was obstinately defended, it was carried by col. Stirling, who made 200 prisoners. The last division, under lord Percy, having surmounted incredible obstacles, carried the advanced works of the Americans. The British gen., after these decisive advantages, again summoned col. Magaw to surrender. The force of the assailants was too great to be resisted, the fort was too small to contain all the men, and the ammunition was nearly exhausted. The garrison, therefore, consisting of about 2,000 men, surrendered as prisoners of war.

FORT WAYNE (*ante*), a city in Allen co., Ind., one of the most important in the northern part of the state; on Maumee river (formed by the St. Mary's and the St. Joseph's); and on the Grand Rapids and Indiana, the Pittsburg and Fort Wayne, and Chicago and Wabash railroads; at the terminus of the Fort Wayne, Jackson, and Saginaw railroad, and on the Wabash and Erie canal; pop. '70, 17,718; in '80, 26,048. It has a court-house, the Concordia Lutheran college, the Fort Wayne (Methodist Episcopal) college, a Roman Catholic convent and two academies, and is the seat of a bishop of that church. It is a place of extensive trade and great enterprise; having a very large number of iron foundries, machine shops, and other manufactories, and several railroad repair shops. The locality was visited by the French about 1700, and not long afterwards a trading post called Fort Miami was established. In 1760, the English built a fort on the e. bank of the St. Joseph's near the mouth. In 1794, gen. Wayne built the government post, and the name still remains.

FORT WILLIAM, a village in the district of Thunder bay, province of Ontario, Canada, on the Kaministiquia river, near lake Superior; pop. 503. The fort was built by the Hudson Bay company in 1803. It is now an important landing-place for lake steamboats, and a station on the Pacific railroad. There are rich silver mines in the vicinity.

FORT WILLIAM HENRY, and **FORT GEORGE**; the first, a fortress constructed in 1755 near lake George by the British under sir William Johnson. During the French war it was a very important point. In 1757, it was captured by the French, aided by the Indians. It was besieged by the marquis de Montcalm with a force of 9,000 men. The garrison consisted of between 2,000 and 3,000, and the fortifications were in good condition. But within six days, col. Monroe, the English commander, capitulated.

The garrison was to be allowed the honors of war, and to be protected until the men could reach fort Edward; but no sooner had the soldiers left the place than the Indians attached to the French army, disregarding the stipulation, fell upon them with a general butchery. These Indians had been employed by the French with the promise that they might take such plunder as they could; and the British officers reported that the troops were robbed, that they were dragged from the ranks and killed. The New Hampshire regiment, which happened to be in the rear, lost 80 out of 200 men. Fort George, now a mere ruin, was about half a mile e. of fort William Henry.

FORT WORTH, the seat of justice of Tarrant co., Texas, on Trinity river and the Texas and Pacific railroad, 175 m. n. of Austin; pop. 2,300.

FORWARDING, the business of receiving and transmitting goods, for doing which the forwarding merchant or warehouseman assumes the expense of transportation, and receives compensation from the owners; but he has no concern with the means of transportation, and no interest in the freight. Such a person is not deemed a common carrier, but is merely a warehouseman or agent, and is required only to use ordinary diligence in sending the property by responsible persons. Forwarding in the United States, like the express business, has become immense; indeed the two are so closely allied that it is difficult to separate them in description. See CARRIERS, COMMON; EXPRESS.

FOSS, CYRUS DAVID, D.D., b. N. Y., 1834; one of the bishops of the Methodist Episcopal church, graduated from Wesleyan university in 1854, and was afterwards appointed teacher of mathematics in Amenia seminary, N. Y., and, in 1856, principal of the same institution. In 1857, he joined the New York conference, and in that and the New York east conference served important appointments until 1875, when he was elected president of Wesleyan university. He was a member of the general conference in 1872 and 1876. In 1880, he was elected one of the bishops of the church, and, at present, has his residence at St. Paul, Minn.

FOSSA MARIANA, the canal made 102 B.C., by Marius from the Rhone parallel to the river nearly to the gulf of Stomalimne. It was constructed to avoid the difficult navigation at the mouths of the river caused by the accumulations of sand by the several streams.

FOSSA'NO, AMEROGIO STEFANI DA, better known as AMEROGIO BORGOGNONE, or simply as IL BORGOGNONE, one of the foremost painters of the Milanese school, nearly contemporary with Leonardo da Vinci. His fame is associated with the church and convent of the Carthusians at Pavia, on which he did much work. There are specimens of his work in the national gallery, London. The dates of his birth and death are not known, but he died in the early part of the 16th century.

FOSSIL BOTANY. See BOTANY, FOSSIL.

FOSSIL FOOTPRINTS. See ICINOLOGY, *ante*.

FOSTER, a co. in n.e. Dakota on the Cheyenne river, formed since the census of 1870. The Dakota river touches the s.w. part.

FOSTER, ABIEL, 1735-1806; b. Mass., a graduate of Harvard, and pastor of a Congregational church, Canterbury N. H. He was several times in the legislature of New Hampshire, and was a member of congress in 1783-84, 1789-91, and 1795-1803. Later in life, he was chief-justice of the state court of common pleas.

FOSTER, BIRKET, b. England, 1812. At the age of sixteen, he was placed with Mr. Landells, the wood-engraver, by whose advice, after he had practiced engraving for a short time, he became a draughtsman. At the age of twenty-one, he illustrated several children's books, and did much drawing for the *Illustrated London News*. He illustrated Longfellow's "Evangeline," Beattie's "Minstrel," Goldsmith's poetical works, and other similar works of the same kind; and has since drawn for many of the better class of illustrated works that have issued from the press, especially a handsome work devoted to English landscape, with descriptions by Mr. Tom Taylor, published in 1863. Having resolved to follow a different branch of art, and having in 1860 been elected a member of the water-color society, he has met with very great success in that line. He has made a number of carvings on wood, especially of landscape and forest pictures, which are of eminent beauty.

FOSTER, JOHN GRAY, 1823-74; b. N. H.; graduated at West Point as lieut. of engineers. He served with the sappers and miners in the Mexican war, and was wounded at Molino del Rey. He was afterwards engaged in constructing fortifications in the coast survey, as assistant professor of engineering at West Point, and as engineer in the building of fort Sumter. When the war of the rebellion began, he was chief engineer of the fortifications in Charleston harbor, and was in fort Sumter during the bombardment. In 1861, he was brig. gen. of volunteers, and was distinguished in the capture of Roanoke island, at Newbern, and at fort Macon. He served as maj. gen. in command of the department of North Carolina and Virginia; in 1863, he commanded the department of Virginia and North Carolina; in the end of that year, the department of the Ohio; in 1864, the department of the South; and in 1865, that of Florida. In 1866, he was mustered out of the volunteer service. Returning to the

corps of engineers in the regular army, he was given charge of the work for the preservation and improvement of Boston harbor, and the construction of defenses of Portsmouth harbor, N. H. He was made lieut. col. of engineers in 1867. He was the author of *Notes on Submarine Blasting*.

FOSTER, JOHN WELLS, LL.D., 1815-73; an American geologist; b. Mass.; educated at Wesleyan university, and became a lawyer in Ohio. He assisted in, and wrote an account of, the survey of the state. He was associated with prof. J. D. Whitney in his survey of the lake Superior copper region. He published *The Mississippi Valley; Prehistoric Races of the United States*; and several scientific papers. He was land-commissioner for Illinois, and president of the association for the advancement of science.

FOSTER, LAFAYETTE SABINE, LL.D., 1806-80; b. Conn.; educated at Brown university, and admitted to the bar in 1831. He was a member of the Connecticut legislature, and speaker of the lower house; mayor of Norwich; in 1855, U. S. senator; re-elected six years later; and in 1865, was chosen president *pro tem.* of the senate. For two years after the death of president Lincoln, he was acting vice-president of the United States. He was again in the state legislature, and again speaker, and in 1870, by a nearly unanimous vote in the legislature, was chosen judge of the supreme court of Connecticut.

FOSTER, RANDOLPH S., D.D., b. Ohio, 1820; studied in Augusta college (Ky.), and as a profession selected the Methodist ministry. In 1850, he was in the New York conference; in 1856, president of the Northwestern university; in 1858, professor in Drew theological seminary; and in 1872, was chosen bishop. He has published *Objections to Calvinism; Christian Purity; Ministry of the Times; and Theism*.

FOSTER, STEPHEN COLLINS, 1826-64; b. Penn.; the author of a great number of popular songs and melodies, among which are: *O Susannah; Nelly was a Lady; Old Uncle Ned; Camptown Races; Old Folks at Home; Willie, we have Missed You; Old Dog Tray; Come where my Love lies Dreaming*, etc. The *Old Folks at Home* is said to have yielded him \$15,000. His *Sadly to my Heart Appealing* was written when he was but 13 years old. For most of his songs he wrote both words and music.

FOUCAULT, JEAN BERNARD LÉON, 1819-68; a French physicist. He studied medicine, but devoted himself to science, acting as Donné's experimental assistant in the latter's lectures on microscopic anatomy; and investigating, with Fizeau, the intensity of sunlight as compared with that of carbon heated in the voltaic arc, and that of lime in the oxyhydrogen blowpipe, and also the duomatic polarization of light. He published in the *Comptes Rendus* of the academy of sciences, 1849, an account of an electromagnetic regulator for the electric lamp. The following year he proved the greater velocity of light in air than in water, measuring it by the use of a revolving mirror with a concave mirror centered in its axis, and established the law that the velocity of light in different media is inversely as the refractive indices of the media. In 1851, he demonstrated the rotation of the earth on its axis by the diurnal rotation in an e.s.w. direction of the plane of oscillation of a long heavy pendulum freely suspended. The following year, he invented the gyroscope. He became physical assistant in the Paris imperial observatory in 1855. In 1857, he invented the polarizer called by his name, and in 1858, succeeded in giving to the speculum of reflecting telescopes the form of a spheroid or a paraboloid of revolution. He set the great reflector in the telescope of the Paris observatory in 1859. In 1865, he published a series of papers on a modification of Watt's governor, showing how its period of revolution could be made constant, and on an apparatus for regulating the electric light. He also showed how the sun can be observed without injury to the eye from the excess of light. He was editor of the scientific portion of the *Journal des Débats* from 1845. In conjunction with Regnault, he published an important paper on binocular vision. He received the decoration of the legion of honor in 1850, and was made an officer in 1864. He also received many honors from scientific associations in France and England.

FOUL IN THE FOOT, ulcers and granulation in the feet of sheep, a contagious disease, generally controlled and cured by applications of tarry substances.

FOUNDATION (*ante*), the artificial structure on which the remainder of an edifice rests. The body of the foundation is the masonry or timber-work used; the *bed*, the prepared surface on which the body rests. The bed may be a leveled surface of rock, sand, or earth, consolidated by beating or by driving piles into it; if the tops of the piles are bound together by a flooring of timbers—called a grillage—this flooring is deemed the bed of the foundation. Rock is the best foundation, but its bearing power should be tested, and its upper surface should be made normal to the direction of the pressure. To avoid expense, the bearing surface may be left in steps, but the steps should be filled with well-fitted masonry, that there may not be undue settlement upon the filled side, in case the lowest step should be much lower than the highest. Great care should be taken to apportion the load to the supporting power of the foundation; if the latter be found inadequate, the area of the foundation should be increased until the weight distributed to each unit of surface shall be brought within the proper maximum.

Engineering science has been severely tested by demands for sure foundations in

places where the soil and substrata are by nature yielding, or exposed to the insidious action of running water, or where both evils are united.

Except upon solid rock, settlement cannot be avoided. It is enough for the safety of the structure if the settlement can be made uniform in all its parts. In some cases, an "area" is made, as under the new capitol at Albany, N. Y. The earth was removed to a proper depth under the whole structure, and the level surface exposed was thoroughly beaten. The surface was then covered with 6 in. of concrete of broken stone and cement, thoroughly grouted; layer after layer was formed, until sufficient thickness was made, and finally the concrete was covered with broad foundation stones, placed so near to each other that the concrete could not rise between the blocks. On this platform the building is erected. If the subsoil be tolerably firm, small blocks will probably find a continuous bearing surface better than large ones, unless care is taken to dress both level; but beds of concrete may be laid, upon which broad stones may be floated before the concrete sets, and perfect contact may be secured. If the ground contain springs of water, the water must be kept from washing out the concrete before it has come to harden. Drains may be made to some point in the work, whence the water may be removed by pumping, or sheet-piling may surround the area, in the manner of a coffer-dam. In England, the foundations of the Rochester bridge were laid in large cylinders filled with masonry; the tide water entered the cylinder, and washed out the concrete; when the tide was out a piece of stout canvas impervious to water was laid in the bottom of the cylinder, the concrete placed upon it, and the water successfully excluded. A yielding soil is frequently consolidated by driving into it timbers called piles. These are trunks of trees, cut as long as may be, sharpened at the smaller end and driven into ground by blows from a heavy iron ram raised and let fall by machinery. A very effective steam pile-driver lately used has the ram joined to the piston of a steam-cylinder; the weight of both ram and cylinder rests on the pile, and the action is so rapid that, after the pile is once started into the earth, it is scarcely allowed to stop until it comes to its final bearing. If piles are driven at distances of, say, 4 ft. between centers, into ground previously loose, the ground must be greatly compressed to make room for so great masses of timber, which also serves to bind the whole mass together. If, farther, the tops of the piles are cut to a common plane, and cross timbers are securely bolted to the heads of the piles, a very secure platform is constructed upon which great weights properly distributed will sink equably, if at all. Sometimes, after the tops of the piles have been cut to the required level, the earth is removed for 2 or 3 ft. and the space is filled with concrete, the grillage being placed above the concrete.

The custom-house at New Orleans, La., is founded upon a plank floor laid 7 ft. lower than the street pavement. A timber platform lies next, consisting of logs 12 in. in diameter laid side by side, and crossed by other logs leaving spaces of 2 or 3 ft. between them; the spaces are filled with concrete, and the platform is covered with a foot of concrete; the walls rest upon inverted arches, the whole area beneath the building, about 300 ft. square, being thus utilized in supporting the structure above. During the first three years, the building sank an average of 19.1 in.; after sixteen years, the difference in the levels of the walls was 3 inches. Foundations are often laid below the surface of water by means of a coffer-dam. To form a coffer-dam a row of piles is driven inclosing the space which the foundation is to occupy, and their tops are bound together by a continuous cap of heavy timber. A parallel row of planks, called sheet piles, is driven with their edges in contact if possible, and the tops are firmly bound to the frame first formed. A second row of large piles, capped, and faced with sheet piles like the first, is driven so as to leave a space of 5 to 20 ft. between the two linings of sheet piles, which face each other. This space is filled with layers of clay thoroughly packed and puddled together, forming a strong dam quite impervious to water. The water inclosed by the dam is pumped away, and the ground is open for the reception of a foundation. It sometimes happens that the bed of the stream is rock, covered with a stratum of mud or earth too thin to support piles, and too porous for sustaining a coffer-dam. A caisson has sometimes been used in such cases. This is a chest, or water-tight box, large enough to receive the intended foundation. The lower courses may be laid in the box, the whole floated to its proper place, and there sunk. The bed of the stream should be nearly level for the reception of the chest; or the mud may be removed by dredging and the caisson be lowered into the cavity so formed; the water will then be likely to wash about the chest more mud or gravel, which will assist in keeping it in place. The water may then be removed from the interior of the caisson and the foundation be built up.

A method of laying foundations in deep water adopted in late years is called the "pneumatic;" the manner of its application is either that of a "vacuum" or a "plenum," according as the pressure of the air within is below or above the usual pressure of the atmosphere. In either case, an iron cylinder, usually constructed in sections, is lowered into the water until its lower end rests on the bottom, while its upper end extends above the surface. If the vacuum process be used, the cylinder is capped, and an air-pump reduces the pressure of the air within. The weight of the tube with the atmospheric pressure on its head, pushes it into the ground, while the water pressing in below the lower end stirs the earth and assists the descent. When descent stops, the air-pump

may be reversed, and the water in the pipe will be slowly driven through the earth; a sudden release of the inner pressure will cause a second influx of water, a disturbance of the soil, and a farther descent of the tube. If the earth contains boulders or buried timbers, the movement of the tube may be stopped before reaching the depth desired by the engineer; or he may wish to remove the interior earth and replace it with masonry, even where the ground is too gravely to keep out the water. In this case an air-lock is placed upon the top of the tube, air is forced into the interior, driving out the water, and workmen are employed within to excavate the earth, and afterward to lay the masonry. The air-lock is a chamber which serves as a vestibule to the interior, and permits the maintenance of a nearly constant air-pressure within. A man enters the air-lock and closes the door behind him; he then opens communication with the interior of the tube, and when the pressure of air is equalized in the two spaces he passes within. In the Harlem bridge at New York the tubes of the pier were 6 ft. in diameter, in sections 10 ft. long; the air-lock was 6 ft. long; the man-holes were 20 in. in diameter. Compressed air was stored in a reservoir upon shore, and was communicated to the tube by a flexible pipe; the flow of air was regulated by a stop-cock. Stop-cocks permitted the discharge of the air into the water at times, thus assisting the tube to sink into the earth. It was found farther that the air-pressure would force sand from the bottom of the tube up through a pipe above the surface of the water, greatly facilitating the labor of excavation and lifting. The tube, while sinking, is liable to incline from the vertical; this has been opposed by placing wedges under the too-rapidly sinking edge; by boring holes on the upper or retarded side of the tubes, that the issuing air may disturb the earth, and permit a more rapid movement of the tube; the most effective remedy has been the beating of the upper end of the tube with a heavy ram; the jar seemed to loosen the soil. The pneumatic caisson is a further development of the pneumatic process. In the method described, the tube is first placed, and the interior masonry afterwards inserted; but when the caisson is used the masonry is built upward while the pier is sunk downward, and the weight serves to force the whole into the soil. The lower part is a structure of iron having walls and a roof; the walls are strong enough to sustain the lateral pressure of the water and earth, and the roof is able to carry the load of masonry which may be piled upon it. The lower edge of the wall is so thin that it may be easily forced into the soil. From the lower portion tubes rise to form a communication between the caisson and the air-chambers above the water, and to afford a passage for the workmen and for raising material. The air-locks may be at the tops of the tubes, but better practice places them at the bottom, just above the caisson. The foundations of the Tay bridge, celebrated first for the splendid engineering achievements of its construction, and later for the utter destruction of its fall, were laid by this method. Each pier consisted of two columns of masonry, so joined at the bottom as to form one large compartment under the pier. At first single columns were sunk separately, but their bases were too narrow, and they were overturned before they were finished. The lowest chamber of the caisson was 22 ft. 7 in. long, 10 ft. 6 in. wide, and 3 ft. high. It was surmounted by a conical frame 5 ft. high, partially closed at the top by a flange $2\frac{3}{4}$ ft. wide, upon which the masonry rested. The bodies of the cylinders were of cast-iron, $\frac{3}{4}$ of an inch thick, $9\frac{1}{2}$ ft. in diameter, and in sections about 4 ft. high. The lowest section was so formed that the two columns were joined by masonry arched over the central part of the caisson. A space of about 2 in. wide, left between the masonry and the iron, was afterward filled with concrete. After the pier was lowered to a permanent position the lower chamber was filled with concrete, and finally the cylindrical interior passage was filled. The piers were partly built near the shore, being supported by pontoons, and at a proper stage of the tide were floated into place, and carefully lowered by the aid of hydraulic power.

Each of the piers and abutments of the bridge over the Mississippi at St. Louis was built in a large caisson, having one large air-space in the base, where the workmen excavated the sand. The base compartment was 9 ft. high, the sides being, for the large pier, $\frac{3}{4}$ of an inch thick, $\frac{1}{2}$ in. in the smaller. Massive cross partitions of timber were built to sustain the roof of the chamber upon which the masonry was placed. There were three shafts, each connected with the air chamber by an air-lock placed below the masonry, where it would not have to be moved as the sinking proceeded. The support given by the timbers which rested on the bottom, the friction on the sides of the caisson, and the buoyancy of the air were the means relied on to sustain the pier in its descent to the bed-rock. When the rock was reached it was 110 ft. below the surface of the water. Doubts had been raised whether the workmen could endure the increase of ordinary atmospheric pressure to $4\frac{1}{2}$ atmospheres, but danger was avoided by frequent changes; so that men were not kept in the compressed air for more than an hour at one time. Exposure to intense pressure for several hours produces paralysis, and in some instances death. All combustible articles burn vigorously in the compressed air, even woolen cloth being extinguished with difficulty. The lamps were inclosed in very strong glass cases, which communicated with the open air, and allowed the combustion to act under ordinary pressure. When the rock was uncovered its depressions were filled with concrete, continued up the sides of the caisson to prevent the water from washing it; the central mass was filled nearly full of wet sand, and concrete was rammed

between the sand and the roof. The sand was used to avoid cost, and was supposed to be as good in its place as cement.

The foundations of the piers of the East river bridge, to connect New York and Brooklyn, were built upon caissons and sunk by the pneumatic process. The Brooklyn caisson is 168 ft. by 102 ft.; the New York caisson, 172 by 102. The Brooklyn pier rests on a firm subsoil at the depth of 50 ft. below the surface of the water; the New York pier rests on a compact layer 2 or 3 ft. above the bed-rock at the depth of 78 feet.

FOUNDLING HOSPITALS (*ante*) are intended to save children from death by exposure, and it is therefore difficult to describe them properly apart from the general subject of infanticide, a practice extremely common among nearly all ancient nations. It may still be studied in such horrible institutions of savage life as the Arcoi of the Society islands, or the Meebra of New South Wales; and it may be found in the greatest variety of form among the tribes of Hindustan. The motives which suggested the practice were sometimes superstitious; more often extremely practical. The natives of Gujarat said to maj. Walker, "pay our daughters' marriage portions and they shall live." The feeling here was one of social dignity, mixed with the strong contempt which many savages express for the unmarried state. But in most cases, children were killed simply because the parents, having no realized wealth, did not expect to be able to clothe and feed them. This is especially seen in the frequent killing of female children and those who are sick and deformed. In some places, the practice has been confined to the children of concubines, of stranger fathers, or of mothers dying from sickness. In the earliest society, the right to kill belonged to the father, sometimes assisted by a person skilled in omens, or by a council of friends. But the usage soon hardened into a binding custom or into express laws. Thus, in the exogamous communities, girls were clearly a source, not of weakness only, but also of danger. At a much later period, the number of a family, or of the daughters, was often fixed by law, and both Lycurgus and the Roman decemvirs directed the slaughter of deformed children. This violence to the domestic affections was probably made easier by the notion, which appears in Greek science and in Roman law, that neither the fetus nor the newly born child is entitled to the privilege of humanity. The Greek pastoral of Longus and the Self-Tormentor of Terence, show still better than the text of laws how the conscience of a civilized society reconciled itself to such cruelties. And the sober reasoning of Aristotle goes even beyond the custom of his time. Pliny the elder defends infanticide as a necessary check on population, and Quintilian and Seneca bear witness to the frightful mortality among children exposed, and the systematic mutilation of those who survive. The legislation of Constantine did not go beyond a declaration that the killing of a son was equal to parricide; but the famous law of Valentinian, Valens, and Gratian punished exposure by the loss of the *patria potestas*, and secured the rights of the foster-father. Finally, Justinian declared that the foundling should no longer be the slave of the foster-father, but should be free. This, however, did not affect Western Europe, where social disorder and the recurrence of famine led to extensive sales of children. Against this evil, which was noticed by several councils, the church provided a rough system of relief, children being deposited in marble shells at the church doors, and tended first by male nurses and then by the foster-parents. Nothing is known of the *brephotrophia*, which are said to have existed in the eastern empire at this time, nor of the public tables which particular emperors are said to have provided for the support of children. The earlier traditions of a hospital at the Cynosarges in Athens, and at the Columna Lactria in the vegetable market at Rome are disputed. It was in the 7th or 8th c. that institutions for foundlings were definitely established in such towns as Treves, Milan, and Montpellier. In the 15th c., Garcias, archbishop of Valentia, was a conspicuous figure in this charitable work; but his fame is entirely eclipsed by that of St. Vincent de Paul, who in the reign of Louis XIII., with the help of the countess of Joigny, Mme. le Gras, and other religious ladies, rescued the foundlings of Paris from the horrors of a primitive institution named La Couche, and ultimately obtained from Louis XIV. the use of the Bicetre for their accommodation. Letters patent were granted to the Paris hospital in 1670. The Hotel-Dieu was the next in importance. No provision, however, was made outside of the great towns; the asylums in the cities were overcrowded and administered with laxity; and in 1784, Necker prophesied that the state would yet be seriously embarrassed by this increasing evil. From 1452 to 1789, the law had imposed on the *seigneurs de haut justice* the duty of succoring children found deserted on their territories. The first constitutions of the revolution undertook as a state debt the support of every foundling. For a time premiums were given to the mothers of illegitimate children, the "children of the nation." At the present time, all the countries of Europe, except Scotland, are provided with foundling hospitals, and there are several such institutions in China. They are also frequent in various countries—in America in Mexico, Brazil, and Canada. The foundling hospital of the sisters of charity, in New York city, was established in 1869, the city giving the site and \$100,000 towards its foundation. It began operations in Oct., 1869, and in four years received 5,076 infants, of whom 2,037 died. A box was placed every night for the receipt of children, and in the first month 29 infants were taken in, many of them less than three hours old. With

a single exception, they were accompanied with memoranda giving the name and date of birth. In the same institution, accommodations are afforded for indigent mothers having young infants. Another institution of the kind is the infants' hospital, under the care of the city. Still another is the nursery and child's hospital, founded in 1854; to which may be added the New York infant asylum. Within the past ten years great interest has been manifested in the protection and health not only of the foundlings, but of other children whose parents or guardians neglect or are unable to support them. There is a society for the prevention of cruelty to children, organized in 1875, which has done much good work; and there are homes and seaside sanitariums for the care of the indigent and the sick. [Condensed from *Encyc. Brit.*, 9th ed.]

FOUNTAIN, a co. in w. Indiana, on the Wabash river; traversed by the Wabash and Erie canal, the Indianapolis, Bloomington and Western, and the Wabash railroads; 400 sq.m.; pop. '70, 16,389. The surface is level, much of it yet covered with forests, the sugar maple being plentiful. Coal and iron are found in abundance. The principal agricultural productions are wheat, oats, corn, butter, and wool. Co. seat, Covington.

FOUNTAIN (*ante*), a spring of water. The term is applied in a restricted sense to such springs as, whether fed by natural or artificial means, have arrangements of human art at a point where the water emerges. Pure water is necessary to man; and the degree of plenty, constancy, and purity in which it is procured, transported, prepared for use, and distributed in populous districts is so fair a standard of civilization, that it seems not unreasonable in Pausanias to put it among the criteria, asking, with reference to Panopæus, if that can be rightly called a city which has neither ruler, gymnasium, forum, nor fountain of water. Among the Greeks we learn, mainly from Pausanias, that fountains were very common in the cities; and springs being very plentiful in Greece, little engineering skill was required to convey the water from place to place. Receptacles of sufficient size were made for it at the springs; and to maintain its purity, structures were raised inclosing and covering the receptacle. It is not surprising that so beneficent an object as a spring of water should be connected with religious belief. It is certain that until modern times fountains have been in some way connected with the religion of the people among whom they sprang, and dedicated to one or other of its personalities. In Greece, they were dedicated to gods and goddesses, nymphs and heroes, and were frequently placed in or near temples. The references to fountains by Pausanias are frequent, but he gives no full descriptions. That of Piræne at Corinth (mentioned also by Herodotus) was formed of white stone, and contained a number of cells from which the pleasant water flowed into an open basin. Legend connects it with the nymph Piræne, who shed such copious tears, when bewailing her son who had been slain by Diana, that she was changed into a fountain. The city of Corinth possessed many fountains. In one near the statues of Diana and Bellerophon, the water flowed through the hoofs of the horse Pegasus. The fountain of Glauce, inclosed in the Odeum, was dedicated to Glauce because she was said to have thrown herself therein, believing that its waters could counteract the poisons of Media. Another Corinthian fountain had a bronze statue of Neptune standing on a dolphin from which the water flowed. The fountain constructed by Theagenes at Megara was remarkable for its size and decorations, and for the number of its columns. One at Lerna was surrounded with pillars, and the structure contained a number of seats affording a cool summer retreat. Near Pharæ was a grove dedicated to Apollo, and in it a fountain of water. Pausanias gives a definite architectural detail when he says that a fountain at Patræ was reached from without by descending steps. Mystical, medicinal, surgical, and other qualities, as well as supernatural origin, were ascribed to fountains. One at Cyanæ, near Lycia, was said to possess the qualities of endowing all persons descending into it with power to see whatever they desired to see; while the legends of fountains and other waters of strange powers to heal are numerous in many lands. The fountain Enneacrunus at Athens was called Callirrhoe before the time the water was drawn from it by the nine pipes from which it took its later name. Two temples were above it, according to Pausanias, one dedicated to Demeter and Proserpine, and the other to Triptolemus. The fountain in the temple of Erechtheus, at Athens, was supplied by a spring of salt water, and a similar spring supplied that in the temple of Poseidon Hippias at Mantinea.

Though no doubt most tribes of other than nomadic habits of life must have contrived, in their settlements, appliances of some kind for maintaining the supply of water constant and pure, very few remains of these have been found that possess any degree of architectural importance. Layard mentions an Assyrian fountain, found by him in a gorge of the river Gomel, which consists of a series of basins cut in the solid rock, and descending in steps to the stream. The water had been originally led from one to the other by small conduits, the lowest of which was ornamented by two rampart lions in relief. The water-supply of Rome and the works auxiliary to it were on a scale to be expected from a people of such great practical power. The remains of the aqueducts which stretched from the city across the Campagna are amongst the most striking monuments of Italy. Vitruvius gives minute particulars concerning the methods to be employed for the discovery, testing, and distribution of water, and describes the properties of different waters with great care, proving the importance which was

attached to these matters by the Romans. The aqueducts supplied the baths and the public fountains, from which last all the populace, except such as could afford to pay for a separate pipe to their houses, obtained their water. These fountains were therefore of large size and numerous. They were formed at many of the castella of the aqueducts. According to Vitruvius, each castellum should have three pipes—one for public fountains, one for baths, and a third for private houses. Considerable revenue was drawn from the possessors of private water-pipes. The Roman fountains were generally decorated with figures and heads. Fountains were often also the ornament of Roman villas and country-houses; the water generally fell from above into a large marble basin, with at times a second fall into a still lower receptacle. To the remains of Pompeii we are indebted for much exact knowledge of Roman antiquity in its minutest particulars; and not the least interesting of the disinterred forms are those of the public and private fountains which the city possessed. Two adjacent houses in Pompeii had very remarkable fountains. One, says Gell, "is covered with a sort of mosaic consisting of vitrified tesserae of different colors, but in which blue predominates. These are sometimes arranged in not inelegant patterns, and the grand division as well as the borders are entirely formed and ornamented with real sea-shells, neither calcined by the heat of the eruption nor changed by the lapse of so many centuries." Cicero had, at his villa at Formiæ, a fountain which was decorated with marine shells. Fountains were very common in the open spaces and at the crossways in Pompeii. They were supplied with leaden pipes from the reservoirs, and had little ornament except a human or animal head, from the mouth of which it was arranged that the water should issue. Not only did simple running fountains exist, but the remains of *jets d'eau* have been found; and a drawing exists representing a vase with a double jet of water, standing on a pedestal placed in what is supposed to have been the impluvium of a house. There was also a *jet d'eau* at the eastern end of the peristyle of the Fullonica at Pompeii.

As among the Greeks, so with the early Celts, traces of superstitious beliefs and usages with relation to fountains can be traced in monumental and legendary remains. At Lochrist, beneath the church, and at the foot of the hill upon which it is built, is a sacred fountain, near which is erected an ancient chapel, which, with its ivy-covered walls, has a most romantic appearance. A Gothic vault protects this fountain. Miraculous virtues are yet attributed to its water, and on certain days the country people still come with offerings to draw it. In the enchanted forest of Brochelelande, so famous from its connection with Merlin, was the fountain of Baranton, which was said to possess miraculous characteristics. The Christian missionaries could not easily overcome beliefs so planted in the hearts of the people, and so strengthened by daily practices. By a wise stroke, whether of policy or instinct, finding themselves unable to eradicate the superstitious which ascribed miraculous power to rocks and woods, streams and fountains, and connected them with the divinities of the old religions, they changed their form and direction by dedicating these objects to the Virgin and to saints, so making the force of the old belief an instrument for its own overthrow. Fountains were attached to the new religion by the erection of statues of the Virgin or of saints upon the possibly rude structures that collected the water and preserved its purity. There is some uniformity in the architectural characteristics of these structures during the middle ages. A very common form in rural districts was that in which the fountain was reached by descending steps (*fontaine grotte*). A large basin received the water, sometimes from a spout, but often from the spring itself. This basin was covered by a sort of porch or vault, with, at times, molded arches and sculptured figures and escutcheons. On the bank of the Clain, at Poitiers, is a fountain of this kind, the *fontaine Joubert*, which, though restored in 1597, was originally a structure of the 14th century. Many such fountains are found in Brittany, and indeed throughout France, and the great antiquity of some of them is proved by the superstitions regarding them which still exist among the peasantry. A form more common in populous districts was that of a large open basin, round, square, polygonal, or lobed in form, with a columnar structure at the center, from the lower part of which it was arranged that spouts should issue, playing into an open basin, and supplying vessels brought for the purpose in the cleanest and quickest manner. The columns take very various forms, from that of a simple regular geometrical solid, with only grotesque masks at the spouts, to that of an elaborate and ornate Gothic structure, with figures of virgins, saints, and warriors, with moldings, arches, crockets, and finials. In the public market-place at Brunswick is a fountain of the 15th c., of which the central structure is made of bronze. Except in Italy, few fountains are of earlier date than the 14th century. The decay of architectural taste in the later centuries is shown by the fountain of Limoges. It is in form a rock representing Mt. Parnassus, upon which are carved in relief Apollo, the horse Pegasus, Philosophy, and the Nine Muses. At the top, Apollo, in 16th c. costume, plays a harp. Rocks, grass, and sheep fill up the scene.

Public drinking fountains in towns and villages are now very common. In the east, they are a very important institution. In Cairo alone, there are 300. These "sebeels" are not only to be seen in the cities, but are plentiful in the fields and villages, and the great number of them endowed for the gratuitous supply of water to the passengers is referred to by Lane as proving the possession by the Egyptians of a benevolent and charitable character.

Purely ornamental fountains and *jets d'eau* are found in or near many large cities, royal palaces, and private seats. The fontana di Trevi, at Rome, is very large and very celebrated, but, from an artistic point of view, almost as bad work as could possibly be conceived. It was erected early in the last century under pope Clement XII., and has all the characteristics of decadence. La Fontana Paolina, and those in the piazza of St. Peter's, are perhaps next in celebrity to that of Trevi, and certainly in better taste. At Paris, the fontaine des Innocens (the earliest) and those of the place Royal, of the Champs Elysees, and of the place de la Concorde are the most noticeable. The fountain of the lions and other fountains in the Alhambra palace are, with their surroundings, a very magnificent sight. The largest *jets d'eau* are those at Versailles, at the Sydenham crystal palace, and at San Ildefonso. With the exception of the last, these are supplied from artificial elevated reservoirs.

Artificial fountains are not abundant in American cities, yet there are some in the parks and squares of New York, and other places, that are occasionally in action, though generally dry. Within recent years drinking fountains for men and animals have been put up liberally in the chief cities, some of which are designed with elaborate art, and decorated with admirable taste. Usually, these are the gifts of private individuals. [Largely from *Encyc. Brit.*, 9th ed.]

FOUQUET, or FOUQUET, NICOLAS, 1615-80; Viscount of Melun and of Vaux, marquis of Belle-Isle, superintendent of finance under Louis XIV. Carefully educated with a view to official position, he was appointed master of requests at the age of 20. He was only 35 when he obtained the post of procureur-general to the parliament of Paris. During the civil war he devoted himself to the interests of the queen-mother, Anne of Austria, and enjoyed her protection. At her instance he was called, in 1652, to the office of superintendent of finance. The finances were then in a state of the utmost disorder from the long wars and the greed of courtiers and officials; and it is stated that he for a time provided the means of meeting the expenses of the state from his own fortune, or by loans obtained upon his own credit. He had long been in the confidence of cardinal Mazarin, the first minister, and was his zealous instrument. But shortly after the marriage of Louis XIV. a quarrel broke out between them, and from that time each was bent on injuring the other. The increasing deficit in the treasury alarmed the king; inquiries were addressed to Colbert, who, secretly ambitious of succeeding Fouquet as minister of finance, made the worst of the case against Fouquet. F. had bought the post of Belle-Isle, and strengthened its fortifications, with a view of taking refuge there in case of disgrace. He had spent large sums in building a palace on his estate of Vaux, which, in extent, magnificence, and splendor of decoration, was almost a forecast of Versailles. At this palace he entertained the king, in Aug., 1661, giving him a fête unrivaled for magnificence, at which *Les Facheux* of Molière was for the first time produced. But the king could not be appeased. By crafty devices, Fouquet had been induced to sell his office of procureur-general, thus losing the protection of its privileges, and he had paid the price into the treasury. The king, however, was only prevented from arresting him at the fête by the pleading of the queen-mother. The arrest was made about three weeks later at Nantes. Fouquet, after several removals from prison to prison, was at last sent to the Bastille. His trial extended over several years. In 1664, he was condemned and sentenced to perpetual exile, and to the confiscation of his property. The sentence, however, was commuted into one of imprisonment for life in the fortress of Pignerol. He bore his fate with fortitude, and composed in prison several devotional works. [Condensed from *Encyc. Brit.*, 9th ed.]

FOURCROY, ANTOINE FRANÇOIS, Comte de, 1755-1809; b. Paris; a French chemist. At the age of 15, he became a student of medicine, lodging in a garret, supporting himself by giving lessons to other students, and making translations for a bookseller. In 1777, *Essai sur les Maladies des Artisans*, his first publication, appeared, being the translation of a Latin work by Ramazzini, with notes and additions. In 1784, his reputation as a chemist gained for him, although Berthollet was his fellow candidate, the lectureship of chemistry at the college of the jardin du roi, which had become vacant by the death of Macquer, one of the last of the phlogistic school. This post he held for 25 years; and so great were the crowds which his eloquence attracted that it was necessary to enlarge his lecture-theater twice. Fourcroy was one of the first converts to the theories of Lavoisier, which he designated "La Chimie Française." Together with Berthollet, Fourcroy was associated with Lavoisier and Guyton de Morveau, in 1786 and 1787, in the preparation of a work entitled *Méthode de Nomenclature Chimique*, published in the latter year. In 1785, a memoir on the tendons gained for him admission into the French academy of sciences. He became, in 1792, one of the deputies of the national convention, and in 1793 a member of the assembly. He procured the release from imprisonment of Desault, surgeon of the Hôtel-Dieu, and prevented the execution of Darcet, though he found no opportunity of rescuing Lavoisier. On the 9th Thermidor he was appointed a member of the committee for the public safety, and in this capacity he instituted three schools of medicine, and assisted in the organization of other schools. After the revolution of Nov., 1799, he was made a counselor of state; and appointed director-general of instruction, in which capacity he secured the formation of numerous professional schools and colleges. On the 16th Dec., 1809, the very day on which by letters-patent he had been

created a count of the French empire, with a yearly pension of 20,000 francs, he was signing some dispatches, when he suddenly exclaimed "Je suis mort," and with these words expired.

FOUR-EYES, a fish. See ANABLEPS, *ante*.

FOURIER, PIERRE, 1565-1640; b. France; became canon in the abbey of Chamonay; afterwards pastor of the parish of Mataincourt. He established several free schools, and laid the foundations of the congregation of Notre Dame, for the education of girls, a society which speedily overspread France and the French American colonies. He was mainly instrumental in founding the new congregation of St. Saviour, the purpose of which was the education of Christian youth. Nine houses were very soon established, and he was chosen superior general. He was beatified 90 years after his death, and is generally known as "Blessed Peter Fourier." The chief house of the sisterhood of Notre Dame in America is in Montreal.

FOURNET, VICTOR, 1801-69; b. Paris; educated at the school of mines. He rendered valuable service in geology, mineralogy, etc., and was a careful observer of physical phenomena. He was the originator of many improvements in the treatment of lead ores, and the discoverer of "Fournet's law" in reference to sulphurization of metals.

FOWLE, DANIEL, 1715-87; b. Mass.; a printer in Boston in 1740; with Gamaliel Rogers, he printed the first American edition of the New Testament. He was arrested for publishing seditious matter in the *Independent Advertiser* and in pamphlets, and kept for a short time in prison. Upon his release he went to Portsmouth, and in 1756 started the *New Hampshire Gazette*, a weekly newspaper still published.

FOWLER, CHARLES H., D.D.; b. Canada, 1837; graduated at Genesee college in 1859, and in 1861 became a Methodist minister. He was pastor of a church in Chicago until 1872, when he was chosen president of the Northwestern university (M. E.) at Evanston, Ill.

FOWLER, JOHN, b. England, 1817; a hydraulic and railway engineer. After engaging in various important works, he became acting-engineer in the construction of the Stockholm and Hartlepool railways. At the age of 27 he was selected as engineer for the construction of the large group of railways known as the Manchester, Sheffield, and Lincolnshire. Having settled in London, he was continuously employed in the laying out and construction of railways and docks, and in the improvement of rivers, and reclamation of lands from the sea. Probably he is best known as "Fowler of the Underground railway," having designed and constructed the metropolitan "Inner Circle railway." Mr. Fowler is consulting engineer to several railways, and to the government of Egypt.

FOWLER, LORENZO NILES, b. Ohio, 1811; brother of Orson, and also a phrenologist and lecturer. He went to England in 1863, and still remains there. Besides works in which he was an assistant, he has published *Synopsis of Phrenology and Physiology*, and *Marriage, its History and Philosophy, with Directions for Happy Marriages*. He was also concerned in editing the *Phrenological Journal*, and the *Water Cure Journal*, afterwards called *Science of Health*.

FOWLER, LYDIA FOLGER, 1823-79; b. Mass.; wife of Lorenzo. She was a graduate of a medical college in New York, and was one of the first American women to practice medicine. She lectured on physiology and the diseases of women and children, and wrote *Familiar Lessons on Phrenology and Physiology*, and similar lessons on astronomy.

FOWLER, ORSON SQUIRE, b. New York, 1809; graduated at Amherst. He and his brother Lorenzo were among the first Americans to accept and teach the doctrines of phrenology, beginning in New York city in 1835. The next year Orson published *Phrenology Proved, Illustrated, and Applied*. This was followed by an almost continuous series of works on the same and on kindred subjects, by the establishment of the firm of Fowler & Wells, the starting of the *Phrenological Journal* (still published), and an almost incredible amount of work in the form of lectures, addresses, and teaching. Some of the works in whole or in part by Orson are *The Self-Instructor in Phrenology and Physiology*; *Memory and Intellectual Improvement Applied to Self-Education*; *Matrimony, or Phrenology Applied to the Selection of Companions*; *Self-Culture, and Perfection of Character*; *Hereditary Descent, its Laws and Facts Applied to Human Improvement*; *Love and Parentage Applied to the Improvement of Offspring*.

FOWLING-PIECE, a light gun for shooting birds. In constructing the barrels of this sporting weapon, the maker endeavors to secure the greatest possible lightness without detracting from the necessary strength. Formerly, wrought-iron only was used, but cast-steel is now generally preferred. The breech-loading principle has been introduced to a great extent, but many sportsmen are still in favor of the muzzle-loader. The manufacture of the best specimens of fowling-pieces demands a high degree of mechanical skill.

FOWNES, GEORGE, 1815-49; b. England. His inclination was towards chemistry, and in 1837 he began to lecture on that science. Two years later he studied under the celebrated Leibig at Giessen, and afterwards filled a number of professorships in his

own country. In addition to his well-known *Manual of Chemistry* he published nearly a dozen works on chemical and cognate subjects.

FOX, GUSTAVUS VASA, b. Mass. 1821; entered the U. S. navy, 1838; served on various stations and in the coast survey, and in the war with Mexico. During the war of the rebellion he was assistant secretary of the navy, in which capacity he discharged the most delicate and responsible duties, with great efficiency and tact, and with no desire for public reputation. After the war, declining to avail himself of opportunities for promotion, he took charge of great woolen mills in Lowell, Mass.; and has since been in connection with a large business firm in Boston.

FOX INDIANS. See SACS and FOXES.

FRAMINGHAM, a t. in Middlesex co., Mass., on Sudbury river, and Cochituate lake, and the Boston, Clinton, and Fitchburg railroad; 24 m. w. of Boston; pop. '80, 6,235. Its agriculture is important; and it has manufactures of cars, coaches; hats, bonnets, woolens, etc. There are several churches, a state normal school, and many good public schools.

FRA MOREALE, or MONTREAL D'ALBANO, d. 1354; a native of Provence, distinguished himself in the service of Louis I. of Hungary in the war with Naples about the middle of the 14th century. At the conclusion of the war he became the chief of a body of brigands, but was soon driven out of the kingdom. He afterwards assisted or opposed this or that petty sovereign, and kept Italy in perpetual terror for a long period. He had at times from 8,000 to 10,000 troops, and showed great ability as a leader and organizer of his rough, plundering bands. He forced from Florence a tribute of 28,000 florins, and from Pisa 16,000; and seems to have had an ambitious purpose of establishing a permanent dominion. Finally, while in Rome, he was arrested by order of Cola di Rienzi, convicted of brigandage, and beheaded. Bulwer pictures him in his novel *Rienzi*.

FRANCESCHINI, BALDASSARE, 1611-89; a painter of the Tuscan school. He was more successful in fresco than in oil painting. His pictures were not unfrequently left unfinished, but many perfected specimens remain, the smaller ones being marked by much originality of conception. The best known of his large oil paintings is "St. John the Evangelist," in a church at Volaterra. One of his latest undertakings was the fresco of the *enpola* of the Annunziata, a production of much labor and energy.

FRANCIA, FRANCESCO (Francesco Raibolini), 1450-1517; a painter of Bologna, the son of a carpenter, was apprenticed to a goldsmith with whom he learned to make dies for medals, becoming so famous for such work as to be made mint-master in his native city. It was only in his maturer age that he turned his attention to painting. He was the friend and correspondent of Raphael, and the great master asserted that few painters had produced more beautiful Madonnas than those of Francia. He was the founder of a school, and has been regarded as second only to Raphael in the brilliancy of his genius.

FRANCIABIGLIO, 1482-1525; a Florentine painter, and partner of Andrea del Sarto, in conjunction with whom he painted, in 1513, the "Marriage of the Virgin," a portion of a series undertaken for the court of Servi in Florence. The friars having uncovered this work before it was quite finished, Franciabigio was so incensed that, seizing a mason's hammer, he struck at the head of the virgin and destroyed it, as well as several of the others; and the fresco, which would otherwise have been his masterpiece in that method, remains thus mutilated to the present day. At Lo Scalzo, in another series of frescoes, on which Andrea was also employed, he executed, in 1518-19, the "Departure of John the Baptist for the Desert," and the "Meeting of the Baptist with Jesus;" and at the Medici palace at Poggio a Caiano, in 1521, the "Triumph of Cicero." Various works which have been ascribed to Raphael are now known or reasonably supposed to be by Franciabigio. Of these we may name the "Madonna del Pozzo," in the Uffizi gallery; the half figure of a "Young Man," in the Louvre; and the famous picture in the Fuller-Maitland collection, a "Young Man with a Letter." These two works show a close analogy in style to another in the Pitti gallery, avowedly by Franciabigio, a "Youth at a Window;" and to some others which bear his monogram. The series of portraits, taken collectively, place the genius of the master beyond dispute.

FRANCIS II., 1543-60; King of France, eldest son of Henry II. and Catherine de Medici. He was married to the unfortunate Mary Stuart, daughter of James V. of Scotland, in 1558, and ascended the French throne at the age of 16. He was merely a tool in the hands of his uncles, the duke of Guise and the cardinal of Lorraine. He died suddenly from an abscess in the ear at the age of 17. But for the fact of his marriage with Mary Stuart, Francis II. would scarcely have been remembered in our day.

FRANCIS I., 1777-1830; King of the Two Sicilies; was the son of Ferdinand I. and became heir to the throne in 1778. He married a daughter of the emperor Leopold II., who became the mother of the duchess de Berri. He contracted a second marriage with a daughter of Charles IV. of Spain. In 1812, he was appointed regent of Naples by his father, and a constitutional government was proclaimed, but the next year his father

deposed him, and dissolved the parliament. In 1815, Francis became governor of Sicily, and in 1820, regent of Naples. In 1825, on the death of his father, he ascended the throne. His reign was marked by corruption, cruelty, and subserviency to Austria. One of his daughters married Ferdinand VII. of Spain, and became the mother of queen Isabella.

FRANCIS II., b. 1836; King of the Two Sicilies; son of Ferdinand II. He married Marie Sophie Amelie, a Bavarian princess and sister of the empress of Austria. He ascended the throne in 1859, and followed his father's system in ruling with an iron hand. When all Sicily, with the exception of Messina, had submitted to Garibaldi, he made strong but unsuccessful efforts to secure foreign intervention in his behalf. After Garibaldi's entrance into Naples the king fled to Capua. There he gathered a considerable army, but was routed by the Garibaldians, and Capua surrendered with 11,000 troops. Francis then retired to the citadel at Gaëta, which, after a short siege, surrendered to Cialdini, and the king took refuge on a French frigate. His dominions were afterwards included in the kingdom of Italy, and he selected Rome as his place of residence.

FRANCIS, CONVERS, D.D., 1795-1863; b. Mass., graduated at Harvard, and became a Unitarian minister at Watertown. In 1842, he was a professor of pulpit eloquence in Harvard university. He wrote lives of John Eliot, the apostle of the Indians, and of Sebastian Râle, the Jesuit missionary, for the *American Biography*, as well as memoirs of other celebrated men.

FRANCIS, JOHN WAKEFIELD, LL.D., 1789-1861; b. New York; for many years one of the most eminent physicians of the city. He was of German and Swiss descent; was educated in Columbia college, and in 1809 received the first degree of M.D. conferred by the college of physicians and surgeons. In 1813, he was lecturer for the college on materia medica and the institutes of medicine, and afterwards filled the chair of materia medica. In 1816, he went to Europe and studied under Abernethy. In 1817, he was professor of the institutes of medicine and of medical jurisprudence, and in 1819 of obstetrics. Dr. Francis was one of the most active members of the New York historical society, and used his influence to promote the study of natural history, fine arts, and typography. He interested himself greatly in the woman's hospital, the state inebriate asylum, and kindred institutions. Among his many publications were *Use of Mercury*; *Cases of Morbid Anatomy*; *Febrile Contagion*; *Anatomy of Drunkenness*; *Memoir of Christopher Colles*; and *Old New York, or Reminiscences of the past Sixty Years*.

FRANCIS BORGIA, SAINT, 1510-72; duke of Gandia and general of the Jesuits. His father sent him to the court of Charles V., where he married Eleanor de Castro, a Portuguese lady of high rank. He accompanied Charles on his African expedition in 1555. Subsequently, he was made viceroy of Catalonia and commander of the order of St. James. Having had some correspondence with Loyola he resolved to enter the Jesuit order. His wife was dead, and other difficulties were removed by papal dispensation. In 1551, he assumed the habit and became a priest. Three years later he became commissary-general of the order in Spain, Portugal, and the Indies, exhibiting great zeal and energy in founding new colleges and extending the power and influence of the brethren. On the death of Lainez in 1565, he was appointed third general of the Jesuits, and in that capacity labored with such success as to receive from the order the title of "the second founder."

FRANCIS OF PAOLA, SAINT, 1416-1507; b. Calabria; founder of the order of Minims. At an early age, for reasons unknown, he retired to a cave by the sea-shore near his native town, and gave himself wholly to a hermit's life, following the example St. Francis, having no bed but the bare rocks, and no other food than the herbs which he gathered in the neighboring woods, or which were sometimes brought to him by his friends. He was joined by some other enthusiasts like himself, and the building of a chapel, in 1436, is generally considered as marking the beginning of the Minimite order. At that time, however, and for many years afterwards, they were mere Eremites of St. Francis, and did not claim to be distinguished from other Franciscans unless by a stricter fidelity to the common principles of the order. In eighteen years, the little community had increased so much in number and in popularity, that it was able to command sufficient funds to build a large church and monastery in 1454. In 1469, owing to reports which he had received, pope Paul II. sent one of his chamberlains into Calabria to ascertain the actual condition of matters at Paola; the account brought back by him was highly favorable, and resulted in the incorporation of the order of the Eremites, Francis being appointed first "corrector" or superior-general. In addition to the usual vows, a special rule was made, which pledged the members to the observance of a perpetual lent. During the following years, several new convents were founded in Calabria and Sicily; and the fame of Francis for sanctity and miraculous powers increased daily. When Louis XI. of France was seized with his last illness, he despatched a special message to beg of the holy man that he would come and restore him to health. But it was not until he had been commanded by pope Sixtus IV., that Francis could overcome his reluctance to undertake so long a journey on so doubtful an errand; and on his arrival at Plessis-les-Tours, in April, 1482, he replied to the king's

entreaties for his intervention to prolong his life, that the lives of kings had their appointed limits, that God's decree was unchangeable, and that for his majesty nothing remained to be done but to resign himself to the divine will and prepare for death. At the request of Louis, Francis remained at Plessis, where he was treated with great respect by that sovereign, and also by his successor, Charles VIII. In 1501-2, a new and stricter constitution was granted to the order by Alexander VI., who at the same time conceded all the privileges and immunities enjoyed by the other mendicant orders, and bestowed upon the Eremites, at the urgent request of Francis, the distinctive name of "Minimi," which has ever since been retained by them. At the same time a lay order of "tertiaries" was sanctioned, under a special rule. In 1506, the fourth vow (to observe a perpetual lent) was made more definite and stringent in its character by Julius II.

FRANCIS DE SALES, SAINT, 1567-1622; b. Savoy; bishop of Geneva, and a well-known Roman Catholic writer. He received his education at a Jesuit college in Paris, studied jurisprudence at Padua, and became an advocate of the senate of Savoy. But his inclinations were towards the church rather than the law. He had received the tonsure as early as 1578, while still a boy at Annecy, very much against his father's wishes, and the spirit shown in this early manifestation of pious self-devotion never forsook him. Notwithstanding all his father's remonstrances, he resolved to enter an ecclesiastical life; and, the office of provost or dean of Geneva becoming vacant, the dignity of this office, which was offered to him, was used as a temptation to secure the father's consent. At length, Francis received holy orders, and entered upon his duties as dean and preacher. He possessed great gifts as a preacher, and his fame soon spread through Savoy. His sermons were marked by great simplicity and persuasiveness. "The only real point of preaching," he said, "is the overthrow of sin and the increase of righteousness;" and the principle of this saying guided him in all his sermons. He preached constantly, and in the simplest and most touching and popular words he could find. His father failed to appreciate his style of preaching, as he had failed to understand his self-denial. "I never refused to preach," Francis tells us, "on the principle of 'give to them that ask you.' My dear father used to hear the bells ringing, and ask who preached. 'Who, but your son,' was often the answer. One day he took me aside and said, 'Provost, you preach too often; even on week days the bells go, and it is always the same story, the provost, the provost! It used not to be so in my day. Sermons were much rarer. But then, to be sure, God knows those were something like sermons—full of learning, well got up, more Latin and Greek in one than you stick into a dozen.'" Francis, however, knew his own mind, and was not moved. "My test of the worth of a preacher," he said, "is when his congregation go away saying not 'what a beautiful sermon,' but 'I will do something.' A man may set forth his own learning and eloquence in a fine sermon, but the true sign of success is when his words induce people to leave off bad habits." And as he preached often, he preached briefly. "The more you say, the less the people remember; the fewer your words, the greater their profit," was his motto. "When a sermon is too long, the end makes one forget the middle, and the middle the beginning." Francis was a man of originality both of mind and character, and destined to become a power in the church to which he had so passionately devoted himself. Accordingly he soon became marked out for arduous work. Savoy was at this time greatly invaded by Calvinistic "heresies." The neighborhood of Geneva—a focus for the dissemination of Protestantism—and the political and military complications arising out of the hostile relations of the duke of Savoy and the king of France, all tended to the progress of Calvinism. Chablais had been invaded, and Protestant ministers long established at Thonon and other towns. For nearly sixty years, in fact, this region had been Protestant, and the people by express stipulation enjoyed the exercise of the reformed religion. A missionary of apostolic fervor and courage was required to recover the lapsed district to the Roman church, and many eyes were turned to the young provost of Geneva, as the only man fitted to grapple with the exigencies of the position. His father, as usual, was the obstacle. He entreated his son not to expose himself to the dangers of such a mission, but Francis felt the call within him, and calmly replied: "I cannot refuse to obey; 'wist ye not that I must be about my father's business?'" The result was that he gave himself for four years (1594-98) to laborious and self-denying work in the district, often, it is said by his flattering biographers, preaching and administering the offices of his church at the peril of his life. His persuasive eloquence and the apostolic simplicity of his life were at first unsuccessful. The inhabitants of Chablais remained hardened in Protestantism. But more violent measures, some of them reflecting little honor on Francis, at length succeeded in reclaiming the district to the Roman Catholic faith. His success in this work led the pope to believe that he might gain over Calvin's celebrated successor, Theodore Beza; and long conferences were held between the Protestant teacher and the Roman Catholic missionary, but without result. In 1598, Francis was appointed coadjutor bishop of Geneva, and became the official companion, as he had long been the warm friend of Claude de Garnier, the aged bishop who had fostered his talents and largely shaped his career. Some years after this, in 1602, he spent some time in France and especially in Paris, where his preaching attracted great crowds, and his influence was

felt from the court of Henry IV. to the poor sisters at Port Royal. Before St. Cyran became the spiritual leader of Angelique Arnaud and others of the devoted band which gathered around him, Francis had given a definite direction to her thoughts and aspirations. It is not the name of Angelique Arnaud, however, but that of another celebrated pietist, who was destined to be associated with Francis de Sales. Shortly after his succession to the bishopric by the death of his aged friend, he met Mme. de Chantal, a character of rare enthusiasm and devotion, whose spirit had been greatly chastened by the loss of her husband and child. She put herself under his direction, cut her beautiful hair, and clothed herself as a religieuse. Her good works were incessant, and she became known as the sainte de Monthelon. At length, Francis prepared a mission for her. Submitting her saintly obedience to various tests, he intimated his decision that she was destined to establish an order for the relief of the sick and poor, the only rules for which were to be "charity and the love of Jesus Christ." The order was not fully established till 1610, but gradually acquired great influence. The relation of the saint to Mme. de Chantal and other devout ladies has been much canvassed. There was much of spiritual coquetry in it, and some of his letters to them contained doubtful sentiments; but there is no reason to doubt the purity of his character, and that his main object was to promote what he considered to be the interests of religion. He liked to be "surrounded by women," but chiefly that he might influence them in the interest of the church. In 1608, Francis published his best known and most valuable work, the *Introduction à la Vie Dévote*, the circulation of which was immense. He became famous through all the Christian world. Henry IV. sought to tempt him by a French bishopric; but he remained true to the country of his birth, and the comparatively quiet and unambitious life which he was able to continue there. [Facts mainly from *Encyc. Brit.* 9th ed.]

FRANCKEN, a family of painters of Antwerp, eleven in number, living in the 16th and 17th centuries. A similarity of Christian names leads to much confusion in classifying their works. When Franz the first found a competitor in Franz the second, he took the name of "the elder," the second being "the younger." But when the third Franz became a rival of the second, the latter took the name of "the elder," and Franz the third became "the younger." The eldest of the Franckens, NICHOLAS of Herenthals, died in 1596. None of his works are known. JEROME, his eldest son, was occupied chiefly in Paris, where he was engaged in decorating the palace of Fontainebleau, where some of his paintings remain. Others are to be found in the Dresden museum, the Amsterdam museum, and the Brunswick gallery. The second son of Nicholas, b. 1544, was the FRANZ FRANCKEN "the first." He studied under Floris, and left a number of his works in Antwerp and Dresden. AMBROSE, third son of Nicholas, left more works than both his brothers. The best of them are the "Miracle of the Loaves and Fishes," and the "Martyrdom of St. Crispin," in the Antwerp museum. Franz "the first" trained his sons to the profession. The third of these sons is FRANZ FRANCKEN "the second," who also signed himself "the younger;" and "the elder" Franz Francken "the second," 1581-1642, was president of the guild. FRANZ FRANCKEN "the third," the last of the name worthy to be mentioned, died in 1667 at Antwerp.

FRANCK, or FRANK, SEBASTIAN, 1500-43; a German writer, studied at Heidelberg, and, about 1524, ordained to the priesthood. He became associated with the reformers, and in 1528, was married at Nuremberg. The same year, he translated Athanasius's *Reconciliation of the Contradictions of the Scriptures*, and two years later, a *Chronicle and Description of Turkey*, which appeared with an introduction by Luther. In 1531, he published, in Strasburg, his *Chronika*, one of the earliest German synopses of universal history. He removed to Esslingen, and afterwards to Ulm, where at first he received the freedom of the city, but afterwards fell into disfavor on account of the publication of a work entitled *Paradoxa*, and, in 1539, he was finally banished. From that time until his death, he never resided long in one place. He was associated at first with the reformers, but did not sympathize fully with them, tending towards a loose liberalism in thought, and even incurring the condemnation of Luther, who called him a "devil's mouth." His historical works, though not critical, show remarkably the modern attention to social conditions. He wrote also several works of minor importance. He is regarded by some as the forerunner of modern German mysticism.

FRANCO-GERMAN WAR (GERMANY, *ante*). There has probably never been a more frivolous cause given for modern warfare than that alleged by the French nation for declaring war against Prussia. June 26, 1870, ex-queen Isabella of Spain formally abdicated the throne in favor of her eldest son, prince Alphonso. July 5, the foreign governments were notified of her abdication, and on the same day the fact was made public that prince Leopold of Hohenzollern had consented to become a candidate for the vacant throne of Spain. This consent was said to have the approval of the king of Prussia. Thereupon the French government, being unable to view the project of placing a Prussian prince on the Spanish throne otherwise than as a menace to the security of French territory, demanded from king William, through count Benedetti, the French ambassador, that not only as the head of the Hohenzollerns, but also as king of Prussia, he should give assurance that he would prevent prince Leopold's acceptance.

At the first audience, July 9, the king replied to this request that, as in the whole affair he had been addressed only as the head of the family, and never as the king of Prussia, and had accordingly given no command for the acceptance of the candidature, he could also give no command for withdrawal. July 12, Leopold's father, the prince Hohen-zollern, destroyed all cause or shadow of pretext for war, by withdrawing his son's name from the candidacy for the Spanish throne; but France made a new demand, proposing to the king that he should expressly pledge himself never to give his consent in case the question of the candidature should at any time be revived. The king decidedly refused to comply with such demand, and declared to the French ambassador that he reserved to himself for that eventuality, as for any other, the right to be guided by circumstances. In consequence, the French government, deeming itself called upon to take immediate steps for the defense of its honor and its injured interests, formally declared war against Prussia, July 19, 1870. While the popular enthusiasm in both countries in favor of war either was or soon became about equal, there proved to be a great difference as to military preparations. The French army in 1870 was represented to number on a peace footing 400,000 men; and the emperor Napoleon naturally conjectured that it could be raised in time of war to twice that number, when the national guard and all branches of the service were included. But according to the best military authorities the number of troops in the active army at the beginning of the war was about 427,000, with about 87,000 regular reserve troops in addition to these; and the additional number of men who could be called upon in case of urgent necessity was only 157,000. Although France had been preparing for the war during the months of May and June, the only section of the active troops ready for marching orders was the so-called "army of the Rhine." This force that marched as rapidly as possible to the Rhenish frontier did not exceed 310,000 men according to the highest estimates. In Germany, however, instead of falling below the estimates, the number of troops was largely increased by the support given to Prussia from the s. German states of Bavaria, Württemberg, Hesse-Darmstadt, and Baden, whose neutrality, if not actual opposition to Prussia, Napoleon had expected. Prussia had on a peace footing 480,000 men, which, in addition to the standing army of the s. German states of 170,325 men, gave Germany an immense advantage from the beginning of the war. That country had 447,000 troops ready for the first battle, besides a first reserve of 188,000, and a second reserve of 225,000, without including the "landwehr," nearly corresponding to the militia of the United States.

From these forces three armies were formed. The first, under gen. von Steinmetz, was placed near Treves, forming the right wing; the second, under prince Frederick Charles, was sent to the Rhenish palatinate; the third, under the crown prince of Prussia, took its position on the frontier of Baden. The French forces were scattered over a line of 85 to 90 m. in length. The first corps, under marshal MacMahon, was placed near Strasburg; the fifth corps, under gen. Faily, along the frontier of the palatinate; the third corps, under marshal Bazaine, near Metz; the second corps, under gen. Frossard, not far from the Prussian frontier, near St. Avold; the fourth corps, under gen. Ladmirault, near Thionville; the reserve force, under gen. Bourbaki and marshal Canrobert, was partly at Nancy and partly at the camp of Châlons; the seventh corps, under gen. Felix Donay, held the fortress of Belfort. These were the positions of the two contending armies towards the end of July, 1870. On the 23d of that month, Napoleon appointed the empress regent of France, and on the 25th left Paris with the prince imperial to take command of the army at Metz. The king of Prussia left Berlin to take his place in the field, July 31, accompanied by gen. von Moltke and count Bismarck, and on Aug. 2d established his head-quarters at Mentz. On the same day the French corps made an attack on the Prussian position, at Saarbrück, in presence of the emperor and his son. After protracted firing the Germans retreated, and the French occupied Saarbrück. The results of this engagement were unimportant. The first serious conflict of the war took place Aug. 4, at Weissenburg, where the German advance-guard was attacked by the French under gen. Abel Douay; it ended after a battle of five hours with the French troops retiring in great disorder. Gen. Douay was killed, and the Germans took 500 prisoners. The Germans had now 520,000 men and 1170 guns ready for fighting orders, while the entire force of the French (with reserves) amounted to only 350,000 men. On Aug. 6, a bloody battle was fought at Saarbrück (Spicheren) between gen. Steinmetz with 120,000 men, and gen. Frossard with 60,000 men. The Germans stormed the heights of Spicheren, and the French force was thrown back in disorder on Forbach and Metz. The Germans captured 2,500 prisoners, and each army was estimated to have 4,000 dead and wounded. On the same day, at Woerth, the crown prince attacked MacMahon, where he was strengthened by divisions of the corps of De Faily and Canrobert. The French suffered a terrible defeat, and lost 6,000 prisoners, including 100 officers; also 6 mitrailleuses, 35 cannon, 200 horses, and a military chest with 220,000 francs. Thus both wings of the French army were completely defeated; the original position could no longer be held, and all the French corps gathered into two large masses to retreat along the line of the Moselle. Two different armies were thus formed—the army of Metz, commanded by marshal Bazaine from Aug. 12, on which date the emperor withdrew as commander-in-chief; and the army of Châlons, commanded by marshal MacMahon. By Aug. 14, the first German army

had advanced to the immediate neighborhood of Metz, and by a successful attack upon the third French corps, baffled the first attempt of the French to retreat to the line of the Marne. This developed later into the battle of Courcelles; the Prussian force engaged was about 80,000 men; the French troops numbered about 60,000. The battle was a mitigation of disaster to the French, and a fearfully bloody success to the Prussians, who lost from 4,000 to 5,000 in killed and wounded. It ended with the retreat of the French troops into the fortifications, and secured to the forces of prince Frederick Charles sufficient time to cut off the French army concentrated at Metz. On Aug. 16, the battle of Mars-la-Tour was fought, at which the entire French army of the Rhine, was repulsed by prince Frederick Charles, and driven back on Gravelotte, though with an immense loss to the Germans. On the 18th, occurred the great battle of Gravelotte, in which 280,000 Germans fought against 160,000 Frenchmen. The French army, occupying a very strong position to the w. of Metz, was, after nine hours' fighting, completely defeated, cut off from its communications with Paris, and driven back towards Metz. The losses were very heavy. The French lost 609 officers and 11,605 men; the Germans 904 officers and 19,658 men. The result was that the French army was shut up in the fortress of Metz. On Aug. 30, MacMahon was beaten, and driven from Beaumont across the Meuse to Mouzon; and on Sept. 1st, 1870, was fought the battle of Sedan, the Waterloo of the second empire, at which gen. Wimpffen commanded the French forces, marshal MacMahon having been wounded the day previous in the struggle near Bazeilles. The army of the Meuse and the third army, after a hot contest, drove the French from all sides to the fortress of Sedan, where, surrounded and defeated, the entire French force surrendered, with the emperor, who was carried prisoner to Wilhelmshöhe. By this capitulation, 84,433 men, 39 generals, and 230 officers of the staff and 2,095 subaltern officers became prisoners of war. On Aug. 31st, while MacMahon was fighting at Sedan, Bazaine made a sortie from Metz, attempting, during that day and the following, to break through toward the north, but was driven back into the fortress. In spite of all precautions the news oozed out at Paris, to the dismay of the imperialists. On Sept. 4, 1870, the third republic was proclaimed, with a government of national defense, of which the chief members were Thiers, Jules Favre, Jules Simon, and Gambetta. Gen. Trochu was its military head. Gradually the Germans closed in on Paris, no serious resistance in the field being attempted. The first siege of Paris lasted from Sept. 19, 1870, to Jan. 30, 1871. In Dec., 1870, at Versailles, the king of Prussia was proclaimed emperor of the new empire of Germany. Gambetta, who escaped from Paris in a balloon, used incredible efforts at Tours to raise fresh armies for France. Before the end of Oct. the capitulation of Metz had released a whole German army, part of which was sent to assist in the siege. At last, Jan. 28, 1871, an armistice was announced, which brought the despairing resistance of Paris to an end. The war elsewhere died out almost at once; the Germans occupied all the forts around Paris. The new republican government of France now had M. Grévy as president, and Thiers chief of the executive power; and it was decided that the assembly should sit at Versailles. On the 18th of Mar., however, the commune of Paris declared itself in opposition to the Versailles republic, and marshal MacMahon was instructed by the Versailles assembly to reduce the insurgent capital. Then followed the second siege of Paris, from April 2 to May 21, with its accompanying horrors. Meanwhile Thiers, after great toil, and with journeys from court to court of Europe, had succeeded in getting peace agreed to. The treaty of Frankfurt was signed May 10, 1871. By it Alsace and a large part of Lorraine were ceded back to Germany, while Belfort, which the Germans had taken, was restored to France; and France engaged to pay five milliards of francs as a war indemnity.

FRANCONIA MOUNTAINS, a cluster of the White mountain group, in Grafton co., N. H., separated from the main group by the Notch. Mt. Lafayette, or the Great Haystack, is 5,290 ft. above the sea. Echo lake, Eagle cliff, Profile rock, Bald mountain, Walker's falls, the Basin, the Flume, the Pool, and Georgiana falls, are points of interest.

FRANK, FRANKING LETTERS (*ante*), in the United States established as a system before the adoption of the federal constitution, and continued with various modifications until the last day of June, 1873. At first granted only on letters of revolutionary soldiers who were in actual service, its privilege was afterwards extended to the president, the heads of departments, the chiefs of bureaus, and certain clerks designated by the postmaster-general. Public documents were also sent free. It was further extended to senators and congressmen for matter addressed by or to them, with certain limitations, before and after the sessions of congress; postmasters could frank official correspondence; newspapers were exchanged free, and petitions to congress were sent free, but the weight of packages was limited to 4 ozs. each. A further extension included the exchanges of the Smithsonian institution, medals, and testimonials granted to soldiers. Since July 1, 1873, when the whole franking system was set aside, an allowance of stamps has been made to the various departments to cover the expense of correspondence and of the transmission of reports and documents.

FRANK, JACOB JOSEPH, 1712-91; b. in Poland; was the founder of a Jewish sect named Frankists, after himself, and Zoharites, after their sacred book. When a young

man traveling in the east, the Turks called him a Frank, which was their common appellation for a European. This surname he always retained. After his return to Poland he settled in Podolia, where he became famous as a Cabalist and gathered around him many persons skilled in the mystical science, some of whom were rabbis. The doctrine which he taught, drawn from that of the celebrated false Messiah *Sabbathai Sevi*, he published in a book which his followers regarded as inspired of God. The rabbis, becoming jealous, annoyed him in many ways and procured his arrest; but the Roman Catholic clergy obtained his release, and the king authorized him to profess his belief openly. His followers now, in their turn, were severe on their adversaries until they were checked by the opposition of the papal nuncio at Warsaw. Some of them escaped to Moldavia, and others, among whom was Frank himself, professed to embrace Christianity. He was baptized at Warsaw, the king standing by proxy as his sponsor. Soon afterwards he was charged with heresy and imprisoned. When the Russians invaded Poland (1773), he was released by them, and finding that his adherents had greatly increased he gathered large collections from them in Poland and Bohemia. From Vienna he went to Brunn in Moravia, where he lived luxuriously on the money which his followers supplied. On his way to the daily public service, he rode in a gorgeous carriage, followed by persons on splendid horses and in glittering attire. In 1786, he removed to Offenbach, where he displayed even greater magnificence, declaring himself to be the messiah, and regarded as immortal by his adherents, until he was stricken down with apoplexy. The sect still exists in Poland, numbering among its members persons in all classes of society.

FRANKFORT, a city in Franklin co., Ky., the capital of the state, on both sides of Kentucky river (which is crossed by bridge), and on the Louisville, Cincinnati and Lexington railroad, 29 m. w.n.w. of Lexington, and 65 m. e. of Louisville; pop. '70, 5,296—2,335 colored. The river is navigable for steamboats both above and below. The city stands on a high plain, and is regularly and handsomely laid out. The surrounding country affords some very fine scenery. On one of the hills near the city is a cemetery in which lie the remains of Daniel Boone and those of several governors and other leading people of the state; and there is a fine monument to the soldiers of Kentucky who fell in the war of 1812 and the Mexican war. Among the prominent buildings are the state-house, governor's house, court-house, penitentiary, the state home for feeble-minded children, the Kentucky military institute, etc. There are manufactures of flour, cotton, whisky, etc., and trade in timber and other produce. The city was begun in 1787, and five years later became the seat of the state government.

FRANKFORT, COUNCIL OF, attended by 300 bishops from Germany, France, Spain, Italy, and England, was held in 794 at Frankfort-on-the-Main, by order of Charlemagne, to consider the decision of the second council of Nicaea concerning the worship of images; and the doctrine of Adoptionism as advanced anew by Elipandus and Felix. The second council of Nicaea, held 787 A.D., having passed a decree sanctioning the worship of images, the pope sent a copy of it to Charlemagne in order to obtain the approval of the French bishops. But that monarch earnestly opposed the decree, and either personally wrote, assisted perhaps by Alcuin, or directed Alcuin in writing for him, the celebrated Caroline books, which strongly condemn every act or appearance of worship paid to images, even to bowing the head and burning lights before them. In arguing, for instance, against the plea that images are necessary to perpetuate and call up the memory of holy things, the writer says, "Unhappy memory which, in order to think of Christ who should never be absent from the heart, needs the presence of an image, and can enjoy his presence only by seeing his image painted on a wall. We Christians, who with open face beholding the glory of the Lord are changed into the same image from glory to glory, are no longer bound to seek the truth in images and pictures." These Caroline books were read as part of the discussion at the council of Frankfort. The decision of the council was against the worship of images and against the second council of Nicaea for sanctioning it. Elipandus, archbishop of Toledo, and Felix, bishop of Urgell, also a city of Spain, revived the opinion, formerly advanced by theologians of Antioch, that Christ in his human nature was the Son of God only by adoption. This language seems to have been sometimes used merely as synonymous with the assumption of human nature by the divine nature of Christ, and therefore as meaning only that Christ the Son of God became man. But its appropriate figurative sense is that Christ's human nature, being only human, was adopted by God, as a man may adopt as his own the son of another. In this sense it was regarded as carrying out the Nestorian doctrine to its extreme results in maintaining that, since Christ, in his human nature, was the Son of God only by adoption, there could be no proper union of his divine and human attributes. It was in this sense, probably, that the council of Frankfort condemned the opinion as heretical. Felix professed to recant it, but afterwards advanced it anew. Elipandus also, secure in his extreme age and in the protection of the Saracens, violently maintained it. It did not, however, gain many new adherents and did not survive its immediate authors.

FRANKFURTER, MOSES BEN SIMEON, about 1700-62; a Jewish scholar of Amsterdam. The *Great Rabbinic Bible*, edited by him, was an important contribution to the

study of the Jewish Scriptures, supplying the text for the subsequent editions of the Hebrew Bible.

FRANKL, LUDWIG AUGUST, b. Bohemia, 1810; a poet of Jewish descent. He was educated in medicine, but preferred journalism and literature. In 1856, he established a school in Jerusalem, and described the condition of the people in his *Nach Jerusalem*, and *Aus Egypten*. One of his poems, *Die Universität*, was the first issued after the abolition of the censorship in Austria, in 1848, and 500,000 copies were sold. His best poetical productions are his epics, *Cristoforo Colombo*; *Don Juan d'Austria*; and *Der Primator*.

FRANKLAND, Sir CHARLES HENRY, 1716-68; b. India; the son of a governor of the East India company's factory at Bengal. Subsequent to 1741, when he was made collector of the port of Boston, Mass., he fell in love with Agnes Surriage, a servant in a hotel at Marblehead, and she became his mistress and afterwards his wife, a marriage prompted, it was said, by his gratitude to her for saving his life in the time of the earthquake at Lisbon, Nov. 1, 1755. He was English consul-general at Lisbon two years later. His widow returned to Massachusetts and resided in Hopkinton, but died in England, 1783.

FRANKLIN, a co. in n.w. Alabama, on the Mississippi border, intersected by Big Bear creek; 700 sq.m.; pop. '70, 8,003—1313 colored. The surface is hilly, and for the most part covered with forests; soil fertile, producing cotton and corn. Co. seat, Frankfort.

FRANKLIN, a co. in n.w. Arkansas, on the Arkansas river, crossed by the Little Rock and Fort Smith railroad; 450 sq.m.; pop. '70, 9,627—651 colored. Surface hilly and undulating, with much woodland; soil fertile. Cotton and corn are the chief products. Bituminous coal is found. Co. seat, Ozark.

FRANKLIN, a co. in n.w. Florida, on the gulf of Mexico, including adjoining islands, and intersected by the Appalachicola river; 475 sq.m.; pop. '70, 1256—475 colored. It has a level surface and sandy soil, much of it covered with swamps. The river bottoms are fertile, but there is little cultivation. Co. seat, Appalachicola.

FRANKLIN, a co. in n.e. Georgia, on the border of South Carolina, drained by the upper branches of Broad river; 450 sq.m.; pop. '70, 7,893—1839 colored. Surface uneven, and soil fertile. The chief productions are corn, cotton, and sweet potatoes. Iron is plentiful; and gold has been found, though in very small quantities. Co. seat, Carnesville.

FRANKLIN, a co. in s. Illinois, on Big Muddy river; 420 sq.m.; pop. '70, 12,652. It is well timbered, with generally level surface, and the soil is fertile, producing the ordinary grains, tobacco, butter, etc. Co. seat, Benton.

FRANKLIN, a co. in s.e. Indiana, on Whitewater river; traversed by the White-water canal and the Whitewater Valley railroad; 380 sq.m.; pop. '70, 20,223; in '80, 20,502. Surface in some parts hilly, and in others level; soil generally fertile, producing corn, wheat, butter, wool, etc. Co. seat, Brookville.

FRANKLIN, a co. in n. Iowa, drained by Iowa river, and intersected by the Central Iowa railroad; 576 sq.m.; pop. '75, 6,558. The surface is undulating, and the soil fertile, producing corn, wheat, etc. Co. seat, Hampton.

FRANKLIN, a co. in e. Kansas, on the Osage river, intersected by the Leavenworth, Lawrence, and Galveston railroad; 576 sq.m.; pop. '78, 12,381. It has an undulating surface, chiefly prairie-land. The soil is fertile, and produces corn, oats, hay, etc. Co. seat, Ottawa.

FRANKLIN, a co. in n. Kentucky, on the Kentucky river (which is navigable), and crossed by the Louisville, Cincinnati, and Lexington railroad; 212 sq.m.; pop. '70, 15,300—4,663 colored. Surface varied, and soil fertile, producing corn, wheat, tobacco, etc. Co. seat, Frankfort, the state capital.

FRANKLIN, a parish in n.e. Louisiana, between the Tensas and Ouchita rivers, intersected by Macon and Beauf bayous, which are navigable for steam-boats; 500 sq.m.; pop. '70, 5,070—2,044 colored. Surface uneven, and covered to a large extent with forests. Cotton and corn are the chief products. Co. seat, Winnsborough.

FRANKLIN, a co. in n.w. Maine, on the border of Canada, reached by the Androscoggin railroad; 1600 sq.m.; pop. '70, 35,866. The surface is undulating, and in parts hilly, and is largely covered with forests. Chief productions, wheat, corn, oats, potatoes, etc. Co. seat, Farmington.

FRANKLIN, a co. in n.w. Massachusetts, bordering on Vermont; intersected by the Connecticut and Deerfield rivers, and crossed by the Vermont and Massachusetts, and the Connecticut River railroads; 650 sq.m.; pop. '70, 32,635. It has a hilly and in some places mountainous surface, with picturesque scenery. Chief productions, corn, oats, rye, potatoes, hay, butter, wool, tobacco, and maple sugar. Co. seat, Greenfield.

FRANKLIN, a co. in s.w. Mississippi, on the Homochitto river; 540 sq.m.; pop. '70, 7,498—3,800 colored. It has an uneven surface, fertile in the vicinity of the

rivers, but otherwise barren. The chief productions are corn and cotton. Co. seat, Meadville.

FRANKLIN, a co. in e. Missouri, bounded on the n. by Missouri river, intersected by the St. Louis and San Francisco, and the Missouri Pacific railroads; 874 sq.m.; pop. '70, 30,098—2,173 colored. The surface is uneven and well timbered; chief productions, wheat, corn, oats, butter, wine, and tobacco. It abounds with rich mines of lead, copper, and coal. Co. seat, Union.

FRANKLIN, a co. in s. Nebraska, on the Kansas border, intersected by Republican river; 576 sq.m.; pop. '76, 1953. It has a prairie surface and fertile soil, yielding excellent pasturage. Co. seat, Bloomington.

FRANKLIN, a co. in n.e. New York, on the Canada border, intersected by the Ogdensburg and Champlain railroad, and drained by the Racket, St. Regis, Saranac, and Salmon rivers; 1718 sq.m.; pop. '75, 30,822; in '80, 36,601. At the n.w. corner the co. is just touched by the St. Lawrence river. It has many lakes, ponds, and small streams, and is greatly diversified by hills, valleys, and mountains. The n. part is level, while the s. is partly occupied by the Adirondack mountains. Most of the surface is covered with forests of pine, hemlock, cedar, oak, ash, sugar maple, etc. There are manufactures of flour, iron, lumber, and leather. The soil is fertile and well adapted for pasturage. Chief productions, hay, butter, oats, potatoes, hops, and maple sugar. Co. seat, Malone.

FRANKLIN, a co. in n. North Carolina, intersected by Tar river, and traversed by the Raleigh and Gaston railroad; 450 sq.m.; pop. '70, 14,134—7,501 colored. It has a level and fertile soil; cotton, corn, and pork are the chief productions. Co. seat, Louisburg.

FRANKLIN, a co. in central Ohio, on the Scioto and Olentangy rivers, intersected by eight or more railroads, which center at the co. seat, Columbus, the capital of the state; 530 sq.m.; pop. '70, 63,019. The surface is generally level, and there are forests of oak, sugar maple, beech, ash, etc. The soil is fertile, producing corn, wheat, oats, hay, butter, etc. The Ohio canal passes through the s.e. part.

FRANKLIN, a co. in s. Pennsylvania, on the Maryland border, bounded on the n.w. by Tuscarora or Cove mountains, and intersected by the Cumberland valley railroad; 740 sq.m.; pop. '70, 45,365. The surface is rough in parts. Iron ore and slate are found. The chief productions are corn, oats, hay, butter, and pork. Co. seat, Chambersburg.

FRANKLIN, a co. in s. Tennessee, on the Alabama border; intersected by Elk river and the Nashville and Chattanooga railroad; 780 sq.m.; pop. '70, 14,970—2,973 colored. The s.e. portion, which embraces a portion of Cumberland mountains, is hilly, but the other sections are level. Chief productions, wheat, corn, butter, and cotton. Co. seat, Winchester.

FRANKLIN, a co. in n.w. Vermont, on lake Champlain and the Canada border, drained by Lamoille and Missisquoi rivers, and traversed by the Vermont Central, and Portland and Ogdensburg railroads, with steamboat navigation by way of the lake; 630 sq.m.; pop. '70, 30,291; in '80, 30,225. The surface is broken, and the soil fertile. Chief productions, wheat, corn, oats, hay, cheese, butter, maple sugar, and wool. Co. seat, St. Albans.

FRANKLIN, a co. in s.w. Virginia, between Staunton river and the Blue ridge, intersected by Blackwater river; 864 sq.m.; pop. '70, 18,264—5,996 colored. Iron is to be there found. The surface is uneven, and the soil fertile, producing wheat, corn, tobacco, butter, etc. Co. seat, Rocky Mount.

FRANKLIN, a city in Johnson co., Ind., the co. seat, on the Jeffersonville, Madison and Indianapolis, and the Cincinnati and Martinsville railroad, 20 m. s. of Indianapolis; pop. '70, 2,707. It is the seat of Franklin college (Baptist), and possesses several high schools and public halls, and a number of manufactures.

FRANKLIN, the capital of St. Mary's parish, La., on Bayou Teeche, 30 m. w. of Brashear City, and about 100 m. from New Orleans; pop. '70, 1265—503 colored. The bayou is navigable for large steamers; and the town has a large trade in exporting cotton, fruits, etc.

FRANKLIN, a city in Venango co., Penn., on the Alleghany river, at the junction of French creek, reached by the Alleghany Valley, the Franklin branch of the Atlantic and Great Western, the Jamestown and Franklin, and the Lake Shore and Southern Michigan railroads, 129 m. by rail n. of Pittsburg; pop. '70, 3,908. It has a court-house, and several manufactures. The chief business is the trade in petroleum.

FRANKLIN, a t. in Williamson co., Tenn., on the Harpeth river, and the Louisville and Great Southern railroad; 18 m. s. of Nashville; pop. '70, 1552. Among its institutions are the Tennessee college for women, and the Harpeth seminary; it possesses several flouring mills and other manufactories.

FRANKLIN, BATTLE OF, Nov. 30, 1864, between the union forces under gen. Schofield, and the confederates under gen. Hood. Gen. Sherman was in n. Georgia

about to begin his march to the sea. In order to force him to turn back, the confederates resolved to invade Tennessee, and early in Oct., Hood with 40,000 men undertook the work. Finding it difficult to maintain his long lines of communication (from Atlanta to Nashville), Sherman sent Thomas to the latter place, abandoned his lines and started on the famous march to the Atlantic coast. Hood made several attacks upon the union forces with the ultimate purpose of seizing Nashville. At Franklin, Schofield was compelled to make a decisive stand. Gen. Grant, speaking of Hood's tactics, says: "Hood, instead of following Sherman, continued his march northward, which seemed to me to be leading to his certain doom. At all events, had I had the power to command both armies, I should not have changed the orders under which he seemed to be acting." The confederates renewed the attack four several times, but without success, and at midnight, Schofield, meeting with little opposition, retired to Nashville. In this action the confederate loss was estimated at 6,000, the union loss at 2,376.

FRANKLIN, BENJAMIN (*ante*), philosopher and statesman, b. Boston, Mass., Jan. 17, 1706; d. Philadelphia, April 17, 1790. His father, Josiah Franklin, an English dyer and chandler, emigrated to America, with his family, in 1682. His mother, a second wife, was the daughter of Peter Folger, a leading citizen of Nantucket. Benjamin Franklin was the fifteenth of seventeen children, and his father intended him to enter the ministry, but was compelled by narrow circumstances to take him from school when ten years old, and in his twelfth year he became an apprentice with his older brother, a printer, founder of the *New England Courant*. He was passionately fond of reading, and contributed anonymously some articles to his brother's paper. The paper was condemned for its political leanings by the general court, and the elder brother imprisoned for a month. The paper being interdicted in his brother's name, Franklin undertook to issue it in his own name; but difficulty with his brother led him at last to leave Boston clandestinely, taking passage on a sailing-vessel to New York; and finding no work there, he went to Philadelphia, where he arrived without friends, and almost destitute. He was only 17 years old, and obtained employment with a printer named Keimer, and found a lodging in the house of his future father-in-law. By some published letters he attracted the notice of sir William Keith, governor of the province, who promised him the government printing, and the following year induced him to go to England to purchase stock for a new printing office; but when arrived in London, Franklin found himself, without the governor's promised help, and was obliged to take service with a printer named Palmer to meet his daily necessities. During a stay of a year and a half in London, he published a pamphlet on *Liberty and Necessity, Pleasure and Pain*, advocating views which he afterwards repudiated as crude and immature. It gained him the notice, however, of Dr. Mandeville and other men of note. In 1726, he returned to Philadelphia with a Mr. Denham, who was founding a dry-goods shop in that city, with whom he was employed as a clerk. Subsequently he worked for his former employer, Keimer, whom he assisted in printing bank-notes in New Jersey, constructing for this purpose a copper-plate press, said to have been the first of its kind in America. He founded, with a fellow-workman, a new printing office, and was married, in 1730, to Miss Deborah Read. He founded, about this time, the *Pennsylvania Gazette*, and rapidly rose to competence and public consideration. He started, in 1731, the "Philadelphia Library," chartered in 1742, "the mother of American libraries," and in 1732, first published his almanac, under the pseudonym of Richard Saunders, which, known as *Poor Richard's Almanac*, was continued for 25 years. After a short visit to his relatives in Boston, he was chosen clerk of the general assembly in 1736, and postmaster of Philadelphia in 1737. In 1743, he planned an academy, which was successfully established six years later and became the foundation of the university of Pennsylvania. In 1744, he organized a scientific society, which became the American philosophical society, and subsequently the American academy of sciences. About this time he invented the open stove which bears his name, and began those investigations in electricity which have ranked his name with great discoverers. His views, though novel, were at length universally accepted, and he was elected F.R.S., and, in 1762, received the degree of LL.D. from the universities of Oxford, St. Andrews, and Edinburgh, and in 1753 the Copley gold medal.

In 1753, he was appointed deputy postmaster-general of the colonies. He was active and influential in the measures for the public defense on the approach of the French and Indian war. He was a commissioner from Pennsylvania at the congress in Albany, 1754, and submitted a plan for a union of all the colonies under one government. His plan was rejected, being criticised in America as containing too much "prerogative," while in England it was thought too "democratic." Franklin maintained that these diverse criticisms showed his plan to be the true mean in which safety would be found. War having actually come, he served effectively in gathering supplies and arranging transportation for Braddock's campaign, subscribing £1000 from his private means.

In the Pennsylvania assembly, he was a recognized defender of colonial interests against the over-exactions of the proprietaries. In 1764, the assembly sent him as its commissioner to England, and other colonies united in intrusting to him their interests. Through his representations the stamp act was repealed in 1766. He earnestly labored to avert the revolution, but, feeling it inevitable, returned to America in the spring of 1775.

He was at once chosen to the continental congress, and was one of the committee to draw up the declaration of independence, of which he was also one of the signers.

During the war of American independence, he represented American interests in Europe, particularly in France, where he was associated as a commissioner with Silas Deane and Arthur Lee. His scientific reputation as well as his dignity of character and practical wisdom, gave him influential access to the leading minds in France, and he powerfully contributed to secure for his country French recognition and material aid. Though not received officially at first, after the news of the defeat of Burgoyne he concluded a treaty, Feb. 6, 1778. He was now made minister plenipotentiary to the French king. He signed the preliminary articles of peace at Paris, Nov. 30, 1782, and the definitive treaty, Sept. 3, 1783. He afterward secured a treaty with Prussia, in which he inserted an article against privateering.

On his return, in Sept., 1785, to America, he was appointed a member of the executive council of Philadelphia, and soon after president of the state. In 1787, he was a member of the convention to form a national constitution. He was then 82 years of age, but was efficiently active in the business of the convention. He was deeply interested in all schemes of usefulness and philanthropy, and one of his last public acts was to sign a memorial to congress as president of the Pennsylvania society for the abolition of slavery.

Upon his death, resolutions of mourning were passed by congress, and the national assembly of France, on the motion of Mirabeau, put on mourning for three days.

Franklin was the first American citizen to win European fame. His leading characteristics were common sense, sagacity, and practical wisdom, with industry, tact, and indomitable firmness in the management of affairs, whether small or great. With these was joined a keen, close observation, and painstaking care. Frugal, and regardful of his own interests, he was eminent in public spirit and patriotic devotion. In imagination and all that connects man with the infinite, he was singularly deficient. He brought all things to the test of practical utility. Yet injustice has been done him by exclusive emphasis of this quality. The influence of Shaftesbury made him a skeptic for a short time during his youth, but his most conspicuous act in the constitutional convention of 1787 was his motion that its sessions be opened with prayer. As a statesman and diplomatist, he carried into the high sphere of national policy that same devotion to truth for its own sake, and the practical wisdom, which gave success to his private undertakings. Turgot's felicitous epigram expresses the world's esteem of Benjamin Franklin: "*Eripuit cælo fulmen sceptrumque tyrannis.*"

FRANKLIN LAKE, in Elko co., Nev., e. of the East Humboldt mountains. It is fresh and shallow, and has no outlet. Reeds flourish there in great quantities.

FRANKLIN, WILLIAM, 1729-1813; b. Philadelphia; a natural son of Benjamin the philosopher, who acknowledged him and brought him up as his own. During the French war, William served in the Pennsylvania line on the Canadian frontier, and became a captain before he was of age. In 1754, he was comptroller of the general post-office, and for a time clerk of the provincial assembly. Going with his father to London, he was there admitted to the bar (1758), and in 1762 was appointed governor of New Jersey. In the revolution he remained loyal to England, and was kept under surveillance by the patriots. He gave his word that he would not leave the province; but in consequence of summoning a meeting of the old colonial assembly, he was arrested and sent to Connecticut, and kept a prisoner for two years. In Nov., 1778, he was exchanged and took refuge in New York. A year before peace he went to England, where he died. His political course estranged his father, to whom it was the cause of much sorrow.

FRANKLIN, WILLIAM BUEL, b. Penn., 1823; a graduate of West Point; joined the topographical engineers; served on gen. Wool's staff in the Mexican war; was acting professor of natural and experimental philosophy at West Point; professor in the New York free academy, and on engineering duty in various places for the government. In the war of the rebellion he served on the side of the union in many capacities, rising to maj.gen. of volunteers. In 1866, he resigned and went into private business.

FRANKLINITE, a mineral consisting of oxide of manganese, oxide of zinc, and peroxide of iron, in the proportions severally of about 16, 17, and 66. It is found in considerable quantity in n. New Jersey, in large veins or beds in mines of zinc lying between the crystalline limestone and the gneiss rocks. Its specific gravity is from 5 to 5.09, and its hardness from 5.5 to 6.5. Franklinite is especially useful for making Bessemer steel.

FRANZ, ROBERT, b. 1815; a German composer, for the most part self-educated. He was assisted in the publication of his first songs by Schuman, and his works are ranked second only to those of his patron. He has written hundreds of songs, and many accompaniments to works of the old masters. He is entirely blind.

FRASER, ALEXANDER CAMPBELL, b. Scotland, 1819; educated in Edinburgh, where he was lecturer on mental philosophy in the new college. From 1850 to 1857, he edited the *North British Review*, in the latter year succeeding sir William Hamilton as profes-

sor of logic and metaphysics in the university of Edinburgh. Among his publications are *Essays in Philosophy*; *Rational Philosophy*; and two works concerning the life, etc., of bishop Berkeley.

FRASER, CHARLES, 1782-1860; b. S. C.; an American artist. He began sketching when but 12 years old; afterwards studied law, then art, and again law, and was admitted to the bar in 1807. After about 10 years' practice, he gave up law and returned to art, devoting himself chiefly to portrait painting. A collection of 450 of his works was exhibited in Charleston in 1857. He wrote *Reminiscences of Charleston*, and many poems and addresses.

FRAUDS, STATUTE OF. The many provisions of the celebrated English statute appear to fall under the following heads: 1. The creation and transfer of estates in land, both legal and equitable, such as at common law could be effected without deed. 2. Contracts which in certain cases could at common law be validly made by oral agreement. 3. Additional solemnities in case of wills. 4. New liabilities imposed in respect of real estate held in trust. 5. The disposition of estates during life. 6. The entry and effect of judgments and executions. The first and second heads contain all that is common professional use is meant by the statute of frauds. They present this important feature, characterizing and distinguishing all their minor provisions; that is, that whereas before their enactment the law recognized only two great classes of contracts, etc.—those which were by deed, and those which were by parol, including under the latter term what was written and what was oral—these provisions introduced into the law a distinction between written parol and oral parol transactions, and rendered a writing necessary for the valid performance of the matters to which they relate. These matters are as follows: Conveyances, leases, and surrender of interest in lands; declarations of trusts of interests in lands; special promises by executors or administrators to answer damages out of their own estate; special promises to answer for the debt, default, or miscarriage of another; agreements made upon considerations of marriage; contracts for the sale of lands, tenements, or hereditaments, or any interest in or concerning them; agreements not to be performed within the space of one year from their making; contracts for the sale of goods, wares, and merchandise for the price of £10 or upwards. By the statute all these must be put in writing, and signed by the party charged, or his attorney. In regard to contracts for the sale of goods, wares, and merchandise, the payment of earnest-money or the acceptance and receipt of a portion of the goods dispenses with the written memorandum.

The substance of this English statute so far as regards the provisions referred to has been enacted in nearly all the states of the American union. Some points of law, coming within the same general policy, but not embodied in the original courts of equity, have been made the subject of enactments.

Both law and equity courts come under the provisions of the statute of frauds, although, in exceptional cases, courts of equity have the privilege of granting relief which may not come within the strict reading of the law. Supposing, for example, that a contract which has been only verbal is fully and efficiently detailed in the bill of the plaintiff in equity, it can be enforced, because no fraudulent intention is to be suspected, and besides, the defendant, by neglecting to urge his right of defense under the statute, may be supposed to have wittingly set it on one side.—So, too, in case of an oral contract, if once the undertaking has been commenced, the completion of it will be decreed; that is to say, if the commencement is more than the mere payment of money, it must be something done entirely with the intention of fulfilling the contract.

FRAUDULENT CONVEYANCE. In England the law now declares that unless the property thus conveyed might have been seized in liquidation it does not constitute fraud, no injury accruing to the creditors in such a case. Should the law permit property which cannot be taken in execution to be devoted to the payment of debts by other means, the creditors would be deprived fraudulently by its withdrawal from them. Fraudulent intention is not so readily presumed if the injury involved in gratuitous disposition of property affects subsequent creditors injuriously, rather than antecedent creditors. A proof that such a disposition of property has the result of a premeditated intention to incur debts, after the means of paying them had been bestowed upon others, would render the conveyance fraudulent and invalidate it. But unless there were direct evidence to the fact, it would be impossible to conclude, for the mere conveyance of property to a wife, child, or friend, without prejudice to any existing claims, that there had been any fraudulent intent in such a disposition of property.

FRAUENBURG, a t. in the district of Königsberg, Prussia, on the Frische-Haff, at the mouth of the Baude, 41 m. s.w. of Königsberg; pop. 4,000. It is the seat of the Roman Catholic bishop of Ermeland. Copernicus was once canon of F., and the cathedral contains his tomb. He is said to have constructed the tower containing the machinery for supplying the town and the neighborhood with water.

FRAUENFELD, a t. in Switzerland, the capital of the canton Thurgau, in the beautiful and fertile district on the Murg, 23 m. n.e. of Zurich; pop. 70 (with adjoining villages), 5,138. It is the artillery depot of c. Switzerland, and had an old tower of the 10th c., a Capuchin monastery, town-house, armory, and public school. Manufac-

tures of yarn and cloth are among the chief industries. There was a battle here in 1799 between the French and Austrians.

FRAYSSINOUS, DENIS ANTOINE LUC, *Compte de*, 1765-1841; a French bishop and Bourbon minister, orator, and controversial writer, ordained a priest in 1789. In Nov., 1801, he began the catechetical lectures which finally developed into the "conferences" of St. Sulpice, where his oratory and lucid exposition attracted great crowds. After Napoleon's arrest of the pope in 1809, his lectures were prohibited; but he returned with the Bourbons in 1814. The events of the hundred days compelled another retirement, from which he emerged in 1816, to be court-preacher and almoner to Louis XVIII. He became bishop of Hermopolis, grand master of the university, member of the academy, peer of France, and minister of ecclesiastical affairs, and public instructor. One of the most important of his administrations was the recall and restoration of the Jesuits in the schools and churches. His most important work is *Defense of Christianity*, issued in 1825, and published in several languages. The revolution of 1830 compelled his resignation, and he retired to Rome, passing his closing years in privacy.

FRAZEE, JOHN, architect; 1790-1852; b. N. J. He began business as a stone-cutter in New Brunswick in 1814, and afterwards had a marble-yard in New York, where his works on mantel-pieces and monuments attracted attention. He made busts of several notable men, including chief-justice Marshall, gen. Jackson, Daniel Webster, John Jay, judge Story, and William H. Prescott. He was a partner of Launitz, and the two were tutors of Crawford.

FRAZIER'S FARM, BATTLE OF, June 30, 1862, an attempt on the part of the confederates to prevent the unionists from re-establishing their communication with James river. The effort was unsuccessful, and the union troops reached Malvern hill on the morning of Aug. 1, and communication with their base of supplies was insured. The conflict is sometimes called the battle of Market cross-roads, or battle of Glendale. The losses were about 1800 on the union, and 2,000 on the confederate side.

FREDEGONDA, 545-597; a queen of the Franks, of low origin, the mistress of Hilperic or Chilperic I., king of Neustria. She induced him to repudiate his true queen, but was disappointed when he married Galsuinda, the sister of the famous Brunhilde (not the mythical Brunhilde of the Volsunga saga), wife of Siegbert, king of Austrasia. Fredegonda caused Galsuinda to be assassinated, and became her successor. She induced a war in which Siegbert was the victor, but he soon afterwards fell by Fredegonda's assassins. Brunhilde was taken captive, but escaping, fled to her own country. Fredegonda's next victim was Meroveus, son of Chilperic, who had been secretly married to Brunhilde. Clovis, his brother, was also killed on a false accusation, and her career of crime continued. Finally, she caused the assassination of her husband, and, seizing the reins of government on behalf of her son Clothaire, retained possession of them until her death.

FREDERICK, a co. in n. Maryland on the Pennsylvania border, n.e. of the Potomac, and intersected by the Monocacy river; also intersected by the Baltimore and Ohio, and a branch of the Pennsylvania railroads, and the Chesapeake and Ohio canal; 770 sq.m.; pop. '70, 47,572-7,572 colored. South mountain, a portion of the Blue Ridge range, runs along the w. border. The surface is hilly or undulating, and the soil fertile, producing wheat, corn, oats, hay, butter, etc. Co. seat, Frederick.

FREDERICK, a co. in n. Virginia on the West Virginia border, drained by Opequan, Back, and Cedar creeks, and intersected by the Harper's Ferry branch of the Baltimore and Ohio railroad; 378 sq.m.; pop. '70, 16,596-2,753 colored. The surface is diversified, and is remarkable for beauty of scenery. The soil is fertile; principal products, wheat, corn, and oats. Co. seat, Winchester.

FREDERICK I., 1425-76; Elector Palatine, called the "victorious." At the death of his father, in 1439, a portion of the palatinate devolved upon him, which he later ceded to his brother Louis IV. In 1449, upon the death of Louis, he assumed the guardianship of his infant nephew Philip, and administered the government. The threatening attitudes assumed towards him by the neighboring princes in 1452 determined him to assume the office of elector for life, with the understanding that his children should not rank as princes, and that the succession should devolve upon his nephew. A coalition was at once formed against him, headed by the emperor Frederick III., but he defended himself ably, and in 1462 defeated at Seckenheim a combined army led against him by the elector Albert Achilles of Brandenburg. His success secured him undisturbed possession of his kingdom till his death. More than 60 fortresses and towns were added to the palatinate during his reign. He left two sons, the elder of whom, Frederick, adopted the ecclesiastical profession; while the younger, Louis, was the founder of the family of the princes and counts of Löwenstein.

FREDERICK II., 1482-1556; Elector Palatine, surnamed the "wise," was the fourth son of Philip the noble-minded, and assumed the electoral crown in 1544, succeeding his brother Louis. When, in 1529, the sultan Soliman besieged Vienna, he assumed command of the imperial army. In 1535, he espoused Dorothea, daughter of Christian II., ex-king of Denmark. Becoming familiar through the teaching of Melancthon with the

principles of the reformation, he joined the Smalkald league, and in later life signed the Augsburg interim and became reconciled to Charles V.

FREDERICK II., 1515-76; Elector Palatine, surnamed the "pious," was the eldest son of John II., palatine of Simmern. In 1556, he succeeded his father, and, on the death of Otto Henry, in 1559, became elector palatine. In 1537, he married the Lutheran princess, Maria of Brandenburg-Baireuth, and declared himself Protestant. In 1560, he established the reformed or Calvinistic worship, which induced an unsuccessful attempt by several of the Lutheran princes in 1566 to obtain an imperial edict against him.

FREDERICK IV., 1574-1610; Elector Palatine, surnamed the "upright," son of elector Louis VI. and Elizabeth of Hesse. His father dying during his infancy, he succeeded, under the guardianship of his uncle, John Casimir, in 1583, but only assumed the reins of government in 1592 upon his uncle's death. The steadfast and firm support he accorded to the Protestant cause renders his reign of importance, as by the protection he afforded it, the Protestant union of Germany was formed in 1601. He raised Mannheim, where many Protestants had taken refuge, to the dignity of a town.

FREDERICK I., 1369-1428; Elector and Duke of Saxony, called the "pugnacious." With his two brothers he succeeded, on the death of the father in 1381, to the inheritance, but they were compelled to divide with their two uncles. Frederick had previously distinguished himself as a soldier, and in 1423, in recognition of his success against the Hussites, the emperor Sigismund made him elector and duke of Saxony. He was defeated by the Hussites at Aussig in 1426, and died within two years. He founded the university of Leipsic in 1409.

FREDERICK II., 1411-64; Elector and Duke of Saxony, called the "meek," son of Frederick I. and Catherine of Brunswick. His reign is remarkable only for the long quarrel with his uncles about the division of territory. The emperor interposed in 1451, and settled the question in his favor.

FREDERICK III., 1463-1525; Elector and Duke of Saxony, called the "wise," grandson of Frederick II.; succeeded his father, duke Ernest, in the government. He founded the university of Wittenberg in 1502, and gave Luther and Melancthon two of the chairs. He never adopted the creed of the reformers, but he accorded them toleration, protected Luther at the diet of Worms, and sheltered him in the castle of Wartburg. In 1493, he visited the Holy Land, and in Jerusalem was made a knight of the Sepulcher. On the death of Maximilian I. he was offered the imperial throne, but declined it, and it was given to Charles V.

FREDERICK AUGUSTUS I., 1750-1827; King of Saxony, son of the elector Frederick Christian; b. Dresden; succeeded his father under the guardianship of prince Xavier, in 1763. In 1769, he married princess Maria Amelia, of Deux Ponts. Family interests, his mother being the sister of the elector of Bavaria, induced him to side with Frederick the great in the Bavarian war of succession against Austria in 1778, and he afterwards joined the league of German princes formed by that monarch. In 1791, he was offered the crown of Poland, but declined it. For some time he would not join the league against France in 1792, but war being declared, his duty as a member of the German empire obliged him to take part in it.

During the war between France and Austria in 1805, he maintained a strict neutrality, but in the succeeding years he joined Prussia against France. The disastrous battle of Jena forced him to conclude a treaty of peace with Napoleon at Posen, Nov. 11, 1806, and after assuming the title of king he joined the Rhenish confederation. During the subsequent wars with Napoleon he was taken prisoner by the allies after the entry into Leipsic, Oct. 19, 1813, and although his liberation followed the congress of Vienna, he was compelled to cede the province of Wittenberg to Prussia. He devoted the remainder of his life to the development of the agricultural, commercial, and industrial resources of his kingdom, and directed his attention especially to the administration of justice. He established hospitals and other charitable institutions, and did much for the encouragement of art and science and the promotion of education. He was especially interested in botany, and the beautiful botanical gardens at Pillnitz originated with him. His reign was marked throughout by justice, probity, moderation, and prudence.

FREDERICK AUGUSTUS II., 1797-1854, King of Saxony, was the eldest son of prince Maximilian and of Caroline Maria Theresa of Parma. His youth was passed in such troubled times that he had frequently to change his residence, but his education was not allowed to suffer and his journeys in foreign states and his intercourse with men of eminence, assisted in his acquirement of a special taste for art and for natural science. He married twice—in 1819, the Duchess Caroline, daughter of the emperor Francis, and in 1832, Maria, eldest daughter of Maximilian I., of Bavaria. In 1830, after an insurrection in Dresden, he was named joint regent of the kingdom with king Anthony, and his wise and liberal reforms rendered him popular, and speedily quelled all discontent. In spite of the enlightened liberality of his administration, Saxony was not to escape the political troubles which assailed Germany in 1848. An insurrection in Dresden in May, 1849, obliged him to avail himself of the help of Prussian troops. But the

rising once quelled, his reign continued tranquil and prosperous. His death was accidental, and was caused by the overthrow of his carriage between Imst and Wenna, in the Tyrol. Frederick devoted much of his leisure to the study of botany.

FREDERICK CITY (*ante*), a city and seat of justice of Frederick co., Md., in a valley 40 m. n.w. of Washington, on the Frederick and Pennsylvania line railroad which connects with the Baltimore and Ohio; pop. '70, 8,526—1822 colored. The city is regularly laid out and well built; lighted with gas and furnished with water from mountain springs. It has extensive trade and important manufactures of iron, flour, wool, paper, etc. Frederick college was established by the state in 1797; a female seminary was started in 1842; there is an establishment of the Jesuits, and a nunnery; and also the state institution for the deaf and dumb.

FREDERICKSBURG, BATTLE OF, Dec. 13-14, 1862. After the battle of Antietam, in the middle of Sept., the union commander (McClellan) remained inactive so long that the people demanded a movement from him or his deposition from command. Near the end of Oct., his forces began to cross the Potomac, while the confederates moved to the valley of the Rappahannock. Early in Nov., the union forces concentrated near Warrenton, and the confederates near Culpepper, 20 m. south. Before McClellan was ready to make an attack he was removed (Nov. 7) and Burnside took his place. The objects at the time were to cover Washington, to take Richmond, or to break up the confederate army. By the middle of Nov., Lee had concentrated the whole of the confederate forces. The union army was organized in three divisions, the right under Sumner, the left under Franklin, the center under Hooker. Burnside resolved to cross the Rappahannock at Fredericksburg, Dec. 11. Three bridges were to be made; Sumner to cross by the upper, Franklin with a part of Hooker's men at the lower; the remainder of Hooker's men to be held in reserve. On the 12th the crossing was effected. The next morning was foggy. The forces were rated at 100,000 unionists, and 80,000 confederates. The attack began early and continued all day. There was a great deal of severe fighting, but all efforts to carry the strong points of the confederates failed. The confederates lay under arms through the night, expecting another attack in the morning. Although Burnside had determined to renew the attack and gave his orders to that effect, he desisted at the earnest persuasion of Sumner, who, with every other corps commander, looked upon such an assault as hopeless. The armies remained in their respective positions up to the night of the 15th, when, taking advantage of a violent storm, Burnside led his forces to the n. bank of the river. The official report of the union loss at Fredericksburg was 1138 killed, 9,105 wounded, and 2,078 missing; total, 12,321; while on the confederate side the loss was 5,309—595 killed, 4,061 wounded, 563 missing.

FREDERICTON (*ante*), a city and port of entry in the province of New Brunswick, Canada; in York co., on St. John river, 54 m. n.w. of St. John; pop. '71, 6,006. The city is on a low point of land and is nearly surrounded by hills. It is well laid out, and has elegant public buildings, comprising the residence of the lieutenant-governor, government house, court-house, city hall, exhibition building, rink, university, barracks, etc. It is the seat of a bishop of the church of England, and the cathedral is a handsome edifice. The St. John river is navigable to this point, 84 m. from its mouth in the bay of Fundy, for large vessels; small steamers go 60 or 70 m. further up. This city is the terminus of the Fredericton and New Brunswick railways. There are many manufactures of iron, leather, machinery, etc. The place was founded by sir Guy Carleton in 1786, and first called St. Ann's.

FREDERIKSBORG, built on the island of Seeland, 22 m. n.w. of Copenhagen, in 1606-20, by Christian IV. of Denmark for a royal palace, after plans drawn by Inigo Jones. It is a red-brick castle of Gothic style, standing on three small islands in a lake. The great hall is elaborately decorated in the ceiling with carving, gilding, and painting, which employed the artist for seven years. There is a beautiful chapel, in which kings of Denmark have been crowned. It has a rich collection of portraits of royal and noble personages.

FREDERIKSTAD, a fortified t. of Norway, at the mouth of the Glommen, 48 m. s.e. of Christiania; pop. '75, 9,562. It was founded by Frederick II., in 1567, and was for a long time strongly fortified. In 1716, Charles XII. of Sweden made an unsuccessful attempt to capture it. The most prominent buildings are the arsenal and the church. It has manufactures of hardware, pottery, and brandy, and some shipping and general commerce.

FREDONIA, a village in Chautauqua co., N. Y., on the Dunkirk, Alleghany Valley, and Pittsburg railroad, 3 m. s. of lake Erie; pop. about 3,000. A great curiosity is the natural spring of inflammable gas by which the place has been lighted for many years. It possesses a state normal school and a training school, and considerable manufacturing business is carried on.

FREEBORN, a co. in s. Minnesota, on the Iowa border, drained by Shell Rock river, and intersected by the Southern Minnesota railroad; 720 sq. m.; pop. '80, 16,069. The surface is dotted with forests, prairies, and small lakes. The soil is fertile, producing cereals, butter, etc. Co. seat, Albert Lea.

FREE CHURCH OF ENGLAND. See **REFORMED EPISCOPAL CHURCH.**

FREE CONGREGATIONS, sometimes called "Protestant Friends," an association of German rationalists who at first professed to be Christians, but afterwards rejected the doctrine of miraculous revelation. Some of them belódy reject the idea of a personal Deity. There are five or six congregations in the United States.

FREEDMEN'S BUREAU, a branch of the war department of the United States, established in 1865, to which was committed the supervision and management of abandoned lands, and the control of all subjects relating to refugees and freedmen from any district embraced within the territory covered by the operations of the army. It was managed by a commissioner, with a number of assistants. It was created to meet a special exigency; much of the work was long ago accomplished, and the principal functions of the bureau ceased in 1870. During its existence the bureau exercised a general supervision over the freedmen and other loyal refugees, protecting their rights, finding work and providing education for them, and furnishing medical treatment. More than 2,100 day and night schools were in operation in 1869, with 2,455 teachers, and 114,552 pupils. The bureau was instrumental in establishing institutions for the higher education of freedmen, such as Howard university at Washington, Atlanta university, Claflin university in South Carolina, and others. The number of rations issued to freedmen was over 15,000,000, and nearly 600,000 sick persons were cared for.

FREEMAN, EDWARD AUGUSTUS, b. England. He was elected scholar of Trinity college, Oxford, in 1841, fellow in 1845, filled the office of examiner in the school of law and modern history in 1857-58 and in 1863-64, and in the school of modern history in 1873. In May, 1872, he delivered the Rede lecture at Cambridge, the subject being *The Unity of History*. He has written much on historical, political, and architectural subjects, and is the author of *A History of Architecture; The Architecture of Llandaff Cathedral; an Essay on Window Tracery; The History and Conquest of the Saracens; The History and Antiquities of St. David's*—the latter conjointly with Dr. Basil Jones, the present bishop of St. David's; *History of Federal Government; History of the Norman Conquest; Old English History; History of the Cathedral Church of Wells; Growth of the English Constitution; General Sketch of European History; Historical Essays; Comparative Politics; Disestablishment and Disendowment, what are they? Historical and Architectural Sketches, chiefly Italian; and The Ottoman Power in Europe, its Nature, its Growth, and its Decline.*

FREEMAN, JAMES, D.D., 1759-1835; b. Mass.; graduated at Harvard, and in 1782 was a reader in King's chapel, an Episcopal church in Boston, and the first of that order in New England. Subsequently he became a Unitarian, and induced the society to alter their prayer-book in accordance with his views. In 1787, he was ordained by his own congregation, and remained rector of King's chapel (now the stone chapel) 48 years. He was a scholarly and philanthropic man, and was one of the founders of the Massachusetts historical society. His was the first Unitarian church in this country, and he was the first minister who openly assumed the name of Unitarian. A volume of his sermons has been published.

FREEMAN, JAMES EDWARD, a native of Nova Scotia, removed with his parents to the state of New York, and after a youth of hardship became a student in the national academy of design. He became an academician in 1833. Since 1840 he has resided in Rome. His pencil is devoted chiefly to historical subjects and portraits.

FREE METHODISTS. See **METHODISTS, FREE (METHODISTS, ante).**

FREEPORT, a city and seat of justice of Stephenson co., Ill., on Pecatonca river, and the Chicago and Northwestern and Illinois Central railroads, 121 m. w. of Chicago; pop. '70, 7,889; in '80, 8,521. It is the seat of Freeport (Presbyterian) college; has a fine court-house, manufactories of reapers, wagons, carpets, machinery, etc. The place was first settled in 1835.

FREE RELIGIOUS ASSOCIATION, established in Boston in May, 1867, declaring its objects to be to promote the interests of pure religion, to encourage the scientific study of theology, and to increase fellowship in the spirit. Members are responsible only for their own opinions, and these do not affect their relation to other associations. Any one may be a member, but to be entitled to vote a small annual fee is required. At the annual meetings members of several denominations have participated, though its influence is regarded as adverse to the doctrines known as evangelical.

FREE-SOILERS, the name of a political party in the United States, which began to be prominent about 1846, rose to much importance during the Kansas-Nebraska struggle, and became merged into the republican party in 1856. The "Wilnot proviso," offered in 1846 by David Wilnot, a democratic member from Pennsylvania, to a bill in congress making an appropriation to negotiate peace with Mexico, was the standpoint of their party. This famous proviso reads: "that there shall be neither slavery nor involuntary servitude in any territory on the continent of America which shall be hereafter acquired by or annexed to the United States by virtue of this appropriation, or in any manner whatsoever, except for crime." The proviso passed the house, but failed in the senate. In both the whig and democratic national conventions in 1846,

this proviso or its substance was introduced into the party platforms: in both it was rejected, and many prominent northern men, of both parties, seceded. In New York, these seceders were chiefly from the democratic party, and were known as "barn-burners" (q.v.). The free-soilers held a national convention at Buffalo in 1848, and nominated ex-president Van Buren as president. The ticket was presented in 13 states, obtaining an aggregate of 291,363 votes out of 2,871,908; but it carried no electoral vote. In 1852, John P. Hale was the candidate of the free-soilers for president, but his vote was only 156,149 out of 3,144,201. In New York alone, nearly 100,000 "barn-burners" had disappeared, by far the greater portion returning to the regular democratic party. In the next vote for president (1856), a considerable number of free-soilers went with the native Americans, but the greater portion sided with the newly-formed republican party, and from that time the free-soilers have not formed a distinctive party.

FREESTONE, a co. in n.e. central Texas, on Trinity river; 900 sq.m.; pop. '70, 8,139—3,368 colored. The surface is hilly or undulating, and the soil is fertile. Productions, corn, sweet potatoes, and cotton. Co. seat, Fairfield.

FREETHINKERS, a name first given to the English deists of the 16th and 17th centuries, and now very often applied indiscriminately to those who for whatever reasons reject Christianity as popularly understood and expounded. Like the names Quaker, Methodist, and even Christian, it is probable that it was first used as a term of reproach, but accepted afterwards by many of those to whom it was applied as an honorable and truly descriptive term. It is not in general use in the United States, the rejectors of evangelical opinions being more generally called skeptics, rationalists, or infidels. There is, however, a considerable number of people in this country who call themselves freethinkers, and who meet in conventions thus designated for the promotion of certain avowed objects. This class of persons are averse to religion in every form, as an invention of priests, and a superstition to be wholly discarded. They are without faith in God or in a future life. They do not take offense when called infidels, professing to regard the name as an honorable one. With some, at least, of this school, freethinking is accompanied by laxity of morals, in practice as well as theory, though the name does not necessarily imply this, and is often used in a different sense. While the various classes of unbelievers have much in common, they are in many respects widely divergent from each other in their views; some being atheists, and some theists; some materialists, and some believers in the spiritual nature of man and in the immortality of the soul; some holding the Bible in contempt as an instrument of priestcraft, and others valuing it highly on moral and spiritual as well as literary and historical grounds; some, seeking to free religion from what they hold to be errors and superstitions, and others to destroy it altogether. To call these different classes by any name implying unity of belief on these several topics would be alike misleading and unjust. Of course, Christians of whatever sect profess to have formed their opinions in the exercise of true freedom of thought; but the name of freethinkers, in common usage, is not applied to them, but to the class of persons above described. Among the chief English freethinkers we may name Hobbes, Hume, Bolingbroke, and Herbert. They and their associates were neither atheists nor materialists, but theists or deists (though these two names are not strictly synonymous). They professed, probably with sincerity, a desire not to destroy religion, but to emancipate it from formalism and dogmatic authority. Lord Herbert, one of the most eminent of their number, avowed his belief in the existence of one supreme God, the duty of worship, piety, and virtue, the efficacy of repentance and the existence of rewards and punishments in this life and the next. Such men would hardly be called freethinkers now. The freethinkers of France, who were the precursors of the great revolution, were of a somewhat different stamp, less thoughtful and more aggressive, especially towards the despotism of church and state. The most eminent freethinker who has lived and written in the United States was Thomas Paine, author of the *Age of Reason*. He is not, however, a fair specimen of the class, morally. See INFIDELITY, RATIONALISM.

FREE TRADE (*ante*), a phrase which, as generally used in the United States, signifies an exchange of commodities between the people of different countries, without any restriction on the part of the government, except so far as it may be thought expedient and necessary to impose a tariff upon foreign goods solely for the purpose of raising revenue. A tariff imposed for the protection or benefit of home manufactures is held by free-traders to be contrary to sound principles of political economy, and therefore, in the long run, injurious to the nation which imposes it. The argument for free trade as thus defined may be briefly and fairly summarized as follows: The imposition of duties upon foreign productions in order to enhance their price and thus to create or foster a market for home productions of the same kind, is in the nature of a tax upon consumers for the benefit of producers, and therefore unjust, it being the right of consumers to buy in the cheapest market. A country which puts no hindrances on imports always deals to the greatest advantage, and that advantage decreases in proportion as restraints are imposed. To prohibit men by law from buying where they can buy cheapest, is to affirm in effect the principle of human slavery, and to erect a barrier against the progress of civilization. Such prohibitions, moreover, by creating an artificial stimulus to home production, often lead to a ruinous competition, resulting in over-

production and loss of capital. Governments should leave men free, without interference, to employ their capital and labor according to their own individual judgment and enterprise, and the exchange of productions between nations should follow the natural laws of political economy. Protection, so-called, is an interference with the laws of nature. Any temporary advantages gained by this means are more than counterbalanced by inevitable evils. The protection of a special production is only temporary, while it does not result in any benefit whatever to the general industry of a nation. Individual enterprise and self-interest are better guides in the investment of capital than legislative enactments. A nation can attain to the highest prosperity and secure the greatest abundance for its inhabitants, not by restrictions upon trade, but by making it absolutely free. Every nation should devote itself to such branches of industry as are best adapted to its soil, climate, and circumstances, and exchange its productions for those of other nations according to the economic laws which exist in the nature of things. The argument that if trade is left thus unrestricted, the opportunities for the employment of home labor will be diminished, is akin to if not identical with that which has so often led men to oppose the introduction of labor-saving machinery. When any trade or manufacture can be profitably introduced into a country, private enterprise is adequate to the purpose, and is the only agent that can be safely relied upon. Protective duties, to be effective, must operate partially, unequally, and therefore unjustly. Protective legislation is always fluctuating and uncertain, while freedom of trade, once established, contributes to the stability of both capital and labor. It is an important argument for free trade that it tends to promote peace and diminish the incitements to war. It promotes friendliness between nations through the sense of interdependence and a community of interests. A vast proportion of the wars that have cursed the human race have grown out of the irritations caused by restrictions upon commercial intercourse. It was formerly supposed that in the commerce of nations what benefited one must of necessity injure another; but this absurdity has been effectually exposed. It is now clearly seen that trade between nations as between individuals is mutually advantageous, and that in keeping open and unobstructed the highways of commerce the brotherhood of the human race is promoted. Foreign trade in its nature differs from the trade at home, and the one no more than the other can be promoted by legislative interference. Those who wish to see the doctrine of free trade thoroughly expounded by its ablest champions are referred to the works of Mill, Macleod, Amasa Walker, Perry, and others; also to Bastiat's *Sophisms of the Protectionists*, and Grosvenor's *Does Protection Protect?* (For the argument against free trade and for protection, see TARIFF.)

FREEWILL BAPTISTS. See BAPTISTS, FREEWILL.

FREEZING MIXTURES, AND OTHER MEANS OF COOLING (*ante*). In general, it may be said that artificial freezing is effected by three methods, that of liquefaction by mixtures, that of the expansion of vapors escaping from volatile liquids, and that of the expansion of compressed air. Before giving a description of ice-making machinery, we refer to the fact that water has more capacity for heat than any other substance, and therefore, for the purpose of cooling substances to moderately low temperatures, such as procurable water may have, that substance will be found the most economical. The freezing of water by rapid evaporation was long ago performed by means of the air-pump; sir John Leslie having, in 1810, succeeded by the use of sulphuric acid, placed alongside the water in the receiver for the purpose of removing the vapor which would otherwise recondense on the descent of the piston. The experiments of Faraday, about 15 years later, with sulphurous acid are also familiar to those who have witnessed class room experiments. All these operations were on a small scale, and not till about 1850 was there anything like a commercial application of ice-making machinery. The beginning of such machines was made by an American, Jacob Perkins, who patented his invention in England, 1834. The apparatus consisted of a flat vessel containing ether, immersed in a vessel containing water, or any substance to be cooled. Vapor of ether was exhausted from this vessel by means of an air-pump, and again recondensed by forcing it through a coil of tube immersed in cold water, by the action of the same pump; and then forced, liquefied, into the original vessel. This answered the purpose of a domestic refrigerator, but was not an ice-producing apparatus. Perkins had many imitators, especially in France. Only one of these, however, made any advance; this was the apparatus of Bourgois, patented in 1846 for the use of hydrocarbons as the volatile liquids on the principle of Faraday's discovery 20 years before. The first important step towards any commercial results in the practical manufacture of ice was by another American, Alexander C. Twining, LL.D., professor of mathematics and natural philosophy in Middlebury college, Vt., in 1848 and 1849, and whose English patent was dated July, 1850. It was a re-invention of the Perkins apparatus in many respects, but, it is stated, without any knowledge of it. In many of its arrangements, especially that for the application of the cold and the use of steam-power, it was original. The fundamental patent was taken out in the United States in 1853; but the first ice-machines were made at Cleveland, O., in 1850, and from that time to 1856, machines were made capable of turning out a ton of ice in a few hours, 6 in. in thickness. In 1856, James Harrison patented machines in London, and put them into use both

in England and in Australia. Their construction was similar to that described in Twining's fundamental patent of 1853, and quotations from that patent apply to the description of one form of Harrison's apparatus. The success obtained with the above-mentioned machines stimulated Ferdinand P. Carré, of Paris, to invent ice-making machines, which were at first little else than a repetition of the American machine, but afterwards really resulted in the perfecting of apparatus which was operated without any mechanical power. This improvement was the result of the use of aqua ammonia as the volatile liquid, the vapor of ammonia having such peculiar affinities for water, that by an ingenious and simple contrivance mechanical power could be dispensed with. Carré's apparatus is worked in the following manner. A wrought-iron boiler capable of resisting a pressure of ten atmospheres is connected by a tube with a freezing chamber having two concentric compartments, the outer one connected with the boiler, and the inner containing the vessel holding the article to be frozen. The freezing-chamber is placed in a cold bath, and to the boiler, into which has been poured a quantity of a saturated solution of ammonia, sufficient heat applied to create a pressure of about six atmospheres, which expels the gaseous ammonia and forces it into the outer compartment of the freezing-chamber, where, by its own pressure and the action of the cold bath in which the chamber is placed, it is condensed in about one tenth of its weight of water. A gauge connected with the condenser indicates when enough ammonia has been condensed, and then the boiler is cooled in a bath. The substance to be frozen is now placed in the inner chamber (the condenser, till now), when the cooling of the boiler removes the pressure which till now has held the ammonia in solution in the inner compartment of the freezing-chamber; and its rapid evaporation in a short time produces an intense cold. Other ammonia machines are used, all constructed on the principle of non-use of mechanical power or effecting vaporization on condensation. The pressure employed in them is from 130 to 180 lbs. per square inch. Rees Reece devised an improvement on Carré's apparatus, which was patented in 1867. A cooler, independent of the boiler, is used to produce evaporation of the condensed ammonia. Variations of these machines are known under the names of the *Atlas*, *Vauz* and *Littmann's*, and others. Machines which employ sulphuric or methylic ether, gasoline and other derivatives of petroleum, have two great disadvantages: the tension of the vapors of these fluids is weak, and therefore the evaporation has to be effected by the aid of pumps, and they are also dangerous from liability to explosions. The *Siebe and West* machine, which is of this kind and now in use, has a refrigerator, condenser, air-pump, and ice-making box. *Johnston and Whitclaw's* machine employs bisulphide of carbon in place of ether. *Holden's* machine employs a non-congealable liquid, as a vehicle of cold, it being passed through a pipe in a cylinder where the volatile liquid, as gasoline or chymogene, is evaporated. It is then conducted to the refrigerator, where, in connection with currents of air, it removes the caloric from the water to be frozen. It only remains to mention the air-machines, or those which operate on the simple principle of the expansion of air. Probably the first of this kind was patented (both in England and America) in 1850, by John Gorrie, of New Orleans. The *Windhausen* machine, in present use, is an improvement upon it. There is no space in this article to describe the working of the apparatus, but an explanation of the general arrangement will probably suffice. The principle of cooling by gaseous expansion, as in the ether and ammonia machines, is employed, and in a similar manner; but instead of a volatile liquid, common air is used. But it must first be compressed, and the more it is compressed the greater and more rapid will be the expansion when the pressure is removed, and therefore the more effective the refrigeration. Compressing the air, however, heats it, and therefore it must be cooled by passing it through pipes surrounded by cold water, or chambers into which sprays of cold water are injected. When it reaches the expansion cylinder it is cooled to nearly ordinary temperature. Here expansion is allowed to take place under various modes, according to the inventor's ingenuity, and the requisite reduction of temperature reduces the water exposed to ice. Kirk's, also Sait's, engines produce ice on the principle of air expansion.

FREIGHT (*ante*), a term formerly applied only to maritime business, such as the hire and use of vessels, but recently extended to goods transported on land, as in railways where there are regular "freight" cars. The term is used to signify also the money or consideration paid for carrying. With regard to freight by ships, the laws in the United States are very nearly the same as in England.

FREIND, JOHN, 1675-1728; an English physician, professor of chemistry at Oxford in 1704. The following year he accompanied the English army to Spain, and wrote an account of the expedition. In 1709, he published a work on chemistry; afterwards became a fellow of the royal society, and of the college of physicians. In 1722, he was in parliament, but being suspected of favoring the restoration of the Stuarts, he was incarcerated in the Tower. There he planned his *History of Physic*, his most important work. From 1725 until his death, he was physician to queen Caroline.

FREINSHEIM, or FREINSHEMIUS, JOHN, 1608-60; b. Germany; a classical scholar and commentator, educated at Marburg and Giessen. He was professor of eloquence in the university of Upsala, and historiographer and librarian to queen

Christina. In 1656, he was honorary professor at Heidelberg, where he died. He devoted the greater part of his time to editing and explaining Latin classical authors.

FREISSER, RICHARD VON; b. Saxony, 1808; educated at Meissen, Göttingen, and Leipsic, and entered a subordinate office in the Saxon ministry of the interior in 1834. On the outbreak of the revolution in Dresden, in 1849, he was appointed provisionally, and afterwards regularly, minister of the interior. He retired in 1852, on account of differences with Von Beust, minister of state, but was made minister of finance in 1859. During the king's absence, in the war of 1866, he was one of the committee intrusted with the government of the kingdom; and on the return of peace, he was minister of foreign affairs. He represented Saxony in the council of the North German confederation in 1837, and in 1870 took an efficient part in the establishment of German unity under the empire.

FRELINGHUYSEN, FREDERICK, 1753-1804; b. N. J.; graduated at Princeton college in 1770, and was a delegate to the continental congress in 1775. In the revolutionary war he served as capt. of artillery, and was in the battles of Trenton and Monmouth. He was afterwards promoted to a colonelcy, and served with distinction throughout the war. In 1790, he was appointed maj. gen., and commanded the expedition against the Indians. He held many local civil offices, and in 1793 was elected U. S. senator.

FRELINGHUYSEN, FREDERICK THEODORE, b. N. J., 1817; nephew of Theodore; graduated at Rutgers college, and was admitted to the bar in 1839. In 1861, he was appointed attorney-general of the state, and was reappointed in 1866. In the latter year he was appointed to fill a vacancy in the U. S. senate. In 1870, he was regularly elected to the same office.

FRELINGHUYSEN, THEODORE, LL.D., 1787-1862; b. N. J., son of Frederick; a graduate of Princeton, was admitted to the bar in 1808, and speedily became distinguished. In the war with England he raised and commanded a company of volunteers. In 1817, he was chosen attorney-general of the state; and in 1829 U. S. senator, acting with the whig party. In 1838, he was made chancellor of the university of New York. In 1844, he was the whig candidate for the vice-presidency. In 1850, he resigned from the university and removed to New Brunswick, N. J., where he died.

FREMONT, a co. in s. central Colorado, intersected by the Arkansas river, and the Denver and Rio Grande railroad; about 1800 sq.m.; pop. '70, 1064. The surface is mountainous, but the valleys are fertile. Copper, silver, coal, and lignite are found. Co. seat, Cañon City.

FREMONT, a co. in s.w. Iowa, on the Missouri river, intersected by the Kansas City, St. Joseph and Council Bluffs, and a branch of the Burlington railroads; 500 sq.m.; pop. '80, 17,653. The surface is diversified with prairies and forests, and the soil is fertile, producing corn, wheat, oats, etc. Co. seat, Sidney.

FREMONT, a city and seat of justice of Sandusky co., Ohio, on the Sandusky river and the Lake Shore, and the Lake Erie and Louisville railroads, 30 m. s.e. of Toledo; pop. '70, 5,455. The city is at the head of steam navigation on the river. It has several important schools, and a number of manufactories, foundries, etc.

FREMONT, JOHN CHARLES (*ante*), b. 1813; a distinguished American explorer and politician, at present (1880) governor of the territory of Arizona. In 1838, he was commissioned second lieutenant in the topographical engineers. In 1840, while in Washington making up reports of certain explorations in which he had been engaged, he met Jessie, the daughter of col. Thomas Hart Benton, U. S. senator from Missouri. She was only 15 years of age, and her father, hearing that she had engaged herself to Fremont, was so enraged that, by his influence, the lieutenant was sent upon a distant expedition to examine the Des Moines river. He completed his work within a year, and, returning, contracted a secret marriage. In 1842, a geographical survey of all the territories of the United States was proposed by him, and, although his idea was not entirely carried out, he was sent to explore the Rocky mountains, and directed to pay particular attention to the South pass. In his accomplishment of this task, he ascended the mountain known as Fremont's peak—13,570 ft. above sea-level. His report of this expedition was much appreciated. His next enterprise was the exploration of the Rocky mountains towards the Pacific coast. Many persons still living remember when school geographies represented the vast region now covered by Nebraska, Kansas, Missouri, etc., as the "great American desert." Early in 1843, F. started with 39 men, and, after a journey of 1700 m., came to Great Salt lake, about which there had been no accurate information. Thence he proceeded northward to the tributaries of the Columbia river, following the valley to fort Vancouver. In November, he started upon his return, choosing a route through an almost unknown region, between the Columbia and Colorado. He and his men suffered terribly from the severe winter weather. In California, he found himself shut in by mountains, which, as he learned from the Indians, had never been crossed by a human being. In spite of this, he proceeded without a guide, and in less than seven weeks arrived at Sutter's fort, in California, the spot where, four years later, gold was to be discovered. Continuing his journey, on the 24th March he proceeded by the w. base of the Sierra Nevada, and crossing that range, revisited Great Salt lake, and by way of the South pass reached Kansas in July, 1844.

Many months were passed in preparing his reports. In the spring of 1845, he started upon his third trip, intending to explore the great basin (now Utah), and the sea-coasts of California and Oregon. After examining the upper portions of the great rivers that run from the "divide" of the Rocky mountains towards the Mississippi and the Pacific, he made a further inspection of Great Salt lake. Thence he continued the exploration of the Sierra Nevada, again crossing that chain in midwinter. Leaving his escort at San Joaquin to recruit, he went on to Monterey, then the capital of California, to ask permission of the Mexican authorities to proceed. Permission was granted; but rumors of the war just commenced between Mexico and the United States alarmed the authorities, and the permission was revoked, and F. was ordered to leave the country at once. He refused, gathered his 64 men together, and established a fort on Hawk's peak, 30 m. from Monterey. Here he was besieged by a large Mexican force for four days, and forced to withdraw in the direction of San Joaquin. He had scarcely started when a message proposing a cessation of hostilities reached him, and F. was able to proceed without further annoyance through the Sacramento valley to Oregon. Near Klamath lake he fell in (May 9, 1846) with a party sent in search of him, with instructions from his government. He was enjoined to watch over the interests of his country in the event of Mexico entering into treaty with England for the transfer of California.

Castro, the Mexican governor in California, had threatened to destroy the American settlements along the Sacramento, and learning this, Fremont at once took stringent measures, and rescued the settlements. In less than a month he freed upper California from Mexican rule, and on the 4th of July was elected governor by the Americans. A week later, he learned that commodore Sloat, who commanded the U. S. squadron in the Pacific, had seized Monterey. On the 19th, Fremont joined him, with 160 mounted riflemen. At the same time, commodore Stockton arrived in the frigate *Congress*, with authority from the United States government to conquer California. At his desire, Fremont organized the mounted men known as the "California battalion," of which he was made major. Stockton also appointed F. civil governor of the territory, and Jan. 13, 1847, a capitulation was concluded which ended the war, and made California a possession of the United States. About this time gen. Kearney, with a force of dragoons, arrived, and a long quarrel ensued, owing to jealousy between him and Fremont, which resulted in the arrest of F., his trial by court martial, and sentence to be dismissed from the service. The president remitted the penalty, but F. was so indignant that he at once resigned. Still intent upon overland exploration, in Oct., 1848, he started on his fourth trip across the continent, and at his own expense. With 33 companions, he sought to find a practicable route to California, passing along the upper waters of the Rio Grande del Norte, meeting several tribes of Indians who were at war with the United States. In crossing the Sierra Nevadas, then deeply covered with snow, he and his men endured the most terrible sufferings, some of them being driven to cannibalism. More than a third of the men and all the animals perished, and those who remained were compelled to return to New Mexico. Still persistent, Fremont collected another party of 30 men, and in the spring of 1849, after prolonged effort, found his way over the various mountain ranges to the Sacramento. Satisfied at last, Fremont settled in California, and was sent by the legislature as senator to represent the new state in congress. He now devoted his attention to the interests of California, although, having drawn the short term, he remained but a few months in office. In 1851, he failed of re-election to the senate, after 142 ballotings. In 1852, he made a tour in Europe, returned the next year, and organized another expedition across the continent to complete the surveys undertaken upon his fourth trip. On this occasion, he and his men endured great hardships, but they discovered passes through the mountains, and finally reached California in safety. In 1856, Fremont was the candidate of the newly formed republican party for president, but was defeated, having only 114 votes, against 174 for James Buchanan, the democratic candidate. In the war of the rebellion, he was appointed maj.gen., and obtained command of the western district. On the last day of Aug., 1861, he ordered the emancipation of the slaves of those who, in his district, were in arms against the United States; but the president revoked it as unauthorized and premature. In this, F. anticipated by only 13 months the president's own proclamation, but in consequence of it he was relieved from command. A few months later, he was reinstated, and intrusted with the command of the mountain region of Virginia, Tennessee, and Kentucky. After the indecisive battle at Cross Keys, June 8, 1862, Fremont declined to serve, as gen. Pope was in command of the army of Virginia, and was an officer whom Fremont ranked. June 12, 1878, he was appointed governor of Arizona territory, and is still in office.

FRENCH, WILLIAM HENRY, b. Md., 1815; graduate of West Point; served in the Indian war in Florida in 1837, and in the Mexican war till the capture of the city of Mexico. In the war of the rebellion he was in command at Key West, and was made brig.gen., serving in the army of the Potomac; was created maj.gen. in 1862, and mustered out in 1864. He afterwards served in command of artillery on the Pacific coast.

FRENCH BROAD RIVER, rising in North Carolina, passing into Tennessee, emptying into the Holston, 3 m. above Knoxville. It is over 200 m. long, is in some

parts navigable by steamboats, and runs through the remarkably fine scenery of the Painted Rocks and the Chimneys.

FRENCHMAN'S BAY, an ocean inlet in Hancock co., Me., running inland about 30 m., with a width in some places of 10 miles. Near the w. side of the entrance is Mt. Desert island. There are good harbors, and the sound is free from ice in winter.

FRENCH PROPHETS, one of the strange sects or orders which arose during the great religious revolution in the time of the Camisards. They were Protestants, but imagined themselves endowed with inspiration. They held that they were immediately influenced by the Holy Spirit; trances very commonly occurred among them, and the populace looked upon their body with a certain amount of superstitious awe. England and Scotland were visited by some of their number. In both countries they succeeded in obtaining converts. They awaited the speedy coming of the Messiah to establish his kingdom, and laid claim to the gift of tongues. They also asserted their ability to work miracles, but having upon one occasion insisted upon their power to raise a dead man to life, the failure of their pretension brought about the dispersion of the sect.

FRENCH WAR IN NORTH AMERICA is the name usually given to the struggle between the French and English (1752 to 1760) for the possession of the North American continent. It is also known as the old French war. The French, being in possession of Canada and Louisiana, intrenched their forces on the banks of the St. Lawrence and near the mouth of the Mississippi, and attempted, by the occupation of various points in the interior, with a line of military posts, to confine the English colonies to a narrow strip of territory on the Atlantic coast. In this project the Indians of the west became the allies of the French. The territory watered by the Ohio was claimed by both France and England, but had been settled by neither. A small settlement of Virginians was established on the Monongahela, and settlements in Ohio were in contemplation. The governor of Virginia organized a force to take possession of the spot now occupied by the city of Pittsburg. But the French obtained possession of the place, which they named fort Duquesne, and held until 1758. In the struggle of the English to dispossess the French at this place, Washington took a prominent part, and it was here that Braddock was defeated in 1755. Ticonderoga, Crown Point, and Niagara were taken by the English in 1759, and the war in America terminated in the capture of Quebec, by gen. Wolfe, but the struggle for possession of Canada continued in Europe until, on Sept. 8, 1760, it was ceded to England. France retained possession of Louisiana until 1762, when she ceded it to Spain, thus yielding her last foothold upon the North American continent.

FRENCH WINES (FRANCE, *ante*). The vineyards cover 4.27 per cent of the surface of France, and are one of the chief sources of its agricultural wealth. They are to be found, more or less, in every district, except in ten northern departments. In 1862, according to statistical documents then published by the government, the departments in which the vine was most extensively cultivated were Hérault (162,172 hectares), Charente-Inférieure (157,753), Gironde (126,220), Charente (100,008), Gers (94,790), Gard (94,200), Dordogne (87,252), Aude (81,869), Var (79,040), Lot-et-Garonne (69,166). The vintage of 1876 gave a total of about 41,846,748 hectoliters (921,033,017 gallons). In everything relating to this culture the French are unsurpassed. The various first-class wines which they produce, under the names of Champagne, Burgundy, Bordeaux, etc., are in general demand in every part of the world. The vineyards produce annually about 7,706,961 pipes of wines (a pipe being usually estimated at 105 gallons), valued at \$52,034,018, and 228,129 pipes of brandy, valued at \$11,433,852, giving an aggregate value of \$63,517,870. In the department of the Gironde there are now about 140,000 hectares of vineyards, producing annually on an average 2,280,000 hectoliters of wine. These wines are celebrated for their variety, their excellence, the low price of their common qualities, and the enormous price of their first qualities. The production amounts to an annual clear value of 180,000,000 francs. The Gironde is practically divided into five wine-producing districts, namely, the Médoc, a district on the left bank of the Garonne, extending from Blanquefort to the sea; the Graves, or high plains above the confluence of the Garonne and Dordogne; the Côtes, or inclined banks of the right side of the Garonne; the Palus, or low marshy territory on both banks of the Garonne in the more immediate neighborhood of Bordeaux; and the district of Entre-Deux-Mers, or low land between the Dordogne and Garonne. The Médoc district produces the wines of Labarde and Cantenac; in its very heart those of Margaux; and northwestward the Saint Julien and Pauillac. Still further north it produces the St. Estèphe, and at its northwestern limits the wines of Saint Seurin-de-Cadourne. The variation of the soil causes a great variety in its products, so that the best and the inferior wines grow frequently side by side. As the vines are the same, and their cultivation identical, the soil must usually account for the difference; but the special conditions of this difference are as yet unknown. The Graves district occupies the heights in the immediate neighborhood of Bordeaux. The vine succeeds very well, and the wines obtained are of greater body, deeper color, and more spirituous than those of the Médoc. The bouquet is not great, and they require six or eight years in barrel before they can be put into bottles. After that time, however, they remain excellent. The first quality of the red wines is that of Château Haut-Biron, classed immediately after those of the

Châteaux Margaux, Lafitte, and Latour. The product is from a surface of forty-four hectares, and the principal vines cultivated here are Gross Viduro, and the Vidure Sauvignonne, together with the Malbec and the Cruchinet. The white wines of the Graves, or Sauternes district, are produced on the left bank of the Loire, in the neighborhood of Langon. The principal vines planted are the Sémillon and the Sauvignonne, mixed here and there with a little Muscatel. The principal growths of the district are the Barsacs, Sauternes, and Bommes. Those wines of the Gironde which are called wines of the hillsides, or "Vin de Côtes," are obtained on a chain of hills which extend along the right bank of the Garonne from Ambarez to Saint-Croix-du-Mont. The most celebrated are those grown in the vineyards of Saint Émilion, which occupy 1041 hectares. The varieties of grapes in this district are the Noir de Prussac, the Murlot, and the Bouchet, or Cabernet. Red and white wines are produced in the districts of Libournais, Fronsadais, and Blayais, and large quantities are exported under various names to America.

Roussillon is the name of an ancient province of France now merged in the department of the Oriental Pyrénées. There are here more than 50,000 hectares of vineyards in which three kinds of wine are produced—liqueur wines, dry wines, and wines largely used for the manufacture of factitious port and other wines. The most celebrated vineyards of the district are those of Banyuls-sur-Mer, Collioure, Port-Vendres, Rivesaltes, and Perpignan. The prevailing wines are the Grenache noir and the Carignan. Large quantities of the Banyuls, Collioure, and Port-Vendres wines are sent to the United States to be there manufactured into liqueur wines, and to the Brazils to be drunk as dry wines. The vineyard of Rivesaltes is the most important on account of its size, having 10,500 hectares. It makes what is called specialties which have a limited reputation. Such are the Muscat, the Maccabéo, the Malvoisie, the Grenache, and the Rancio.

Languedoc, like Roussillon, is the name of an ancient province in France, and comprises the essential parts of the departments of the Aude, of the Hérault, and a portion of the Gard. The wines in this part are rich in color, and distinguished by much body and spirituousity; they are the objects of a vast and increasing commerce, as no country can compete with the united advantages of climate, soil, and situation, by means of which great quantities of cheap and salable wines are produced. The surface occupied by vineyards in the three departments mentioned, comprises 258,192 hectares. The wines are divided into two categories, wines for the distillery, and wines of commerce, and are known generally under the name of *vins du midi*. The vines cultivated are the Carignan, the Terret-noir, the Grenache, the Monrastel, the Aspiran, the Geillade, and its variety the Sinsau, the black Picpoule, the white Picpoule, and the Clairette. For the distillery wines only two vines are cultivated, namely the Aramon and the Terret-bourret; they cover the whole of the plains of Hérault and of St. Guilhem upon the sea, the plain of Lunel, of Orbe, and a part of that of Aude. The remarkable growths in the department of the Gard are the Lédénon, Langlade, and St. Gilles; in the department of Hérault, the St. Georges D'Orques, St. Chrystol, and St. Drézéry (red wines), the Picardans (white wines), the Frontignans and Lunels (muscat wines). The best wines of the Rhône valley are produced on the right bank of the Rhône, in the communes of Laudun, Chusclan, Tavel, Roquemaure, which belong to the department of the Gard; in the St. Péray district, department of the Ardèche, and at Condrieu and Côte-rôtie, department of the Rhône. A much smaller quantity of wine is grown on the left bank of the Rhône, but this includes the products of Château-neuf-du-Pape, department Vaucluse, and of L'Ermitage, department of the Drôme. The vineyards of Crozes, Larnage, and Mercurol, in the same department, produce wine which in quality follows immediately after Ermitage. Of these wines those grown in the Gard have the general character of the wines of the Midi; the black grapes grown in this district are the Terret, Picpoule, Piran, Camanéze, Grenache, or Alicante, and in some localities the Uni and the Bourboulénque are grown on a small scale with the others. Of the white grapes the Clarette and Calitor form about a fifth part; the others are Uni blanc, Picardan, and several unimportant varieties. The wines of Château-neuf-du-Pape owe their trade value and export to Burgundy to their spirituousity and color. The most remarkable are the vineyards of La Nerthe, Fortia, Vandieu, and the Cru de Condoreet. The most celebrated growths of St. Péray are Côteau-Gaillard, Solignacs, Thioulet, and Hongrie; after these range Savoie-les-Sapettes and Malayon. The dominant vine is the Grosse Roussette. The white St. Péray has a character of its own, particularly in the effervescent state. The vineyards of the Ermitage are of three kinds, according to the soil, granitic, constituting the so-called "Mas des Bessas," alluvial, forming the "Mas du Méal," and alluvial clayey, forming the "Mas de Greffieux." The high quality of the Ermitage wines depends upon the combination of these three vineyards, the produce of which is always sold mixed. Red Ermitage is used largely for adulterating Bordeaux wines. When genuine it is distinguished by great richness, a lively purple color and a special bouquet; it becomes by these united qualities the best wine of the south of France.

The vineyards of Crozes, Larnage, and Mercurol take rank next to that of Ermitage. The wine of the vineyards of Larolière and Die is a sweet, syrupy drink. Under the name of white wines of Condrieu are comprised the wines grown in that locality and

also those of St. Michel in the department of the Loire. The wine of these districts is a kind of imperfect champagne. The vineyard of Côte-Rôtie is situated in the commune of Ampuis, and is divided into five parts by the two principal growths, Côte-Brune, where the Terine noire is more prevalent, and the Côte-Blonde, which has more Vionniers. The wine is fiery and heady, but has great fineness and bouquet.

The districts of the Beaujolais, Mâconnais, and the Chalon Côte are situated in the higher parts of the valleys of the tributaries of the Rhône, particularly the Saône. The high Beaujolais consists of the cantons of Beaujeu and Belleville, where the best vineyards are met with. The low Beaujolais produces a greater quantity of wine, but of a less distinguished quality. The prevailing vines are the Petit Gamay and the Gamay Nicolas. The Mâconnais district includes the vineyards of Thorins and the Romanèche, which produce the finest class of wine, the vineyard of St. Amour, Davayé, Ponilly, the whole district n. of Mâcon, and the canton of Lugny. Formerly the Pineau known under the name of Bourguignon was the exclusive vine of the distinguished growths; but this has almost entirely disappeared, and given place to the Gamay. The wine of Mâcon of cheap quality is mostly sold in Paris, Lyons, and Geneva. The better Mâcon wine is sometimes carried into the Bourgogne to be sold as wine of that country. The best wines of the Côte of Chalon are obtained on the incline which commences n. of Chalon, runs through Jivry, and then loses itself in the Mâconnais. Ordinarily only common wines are produced in the Côte of Chalon district. The better qualities have much likeness to the half fine wines and great ordinaires of the Côte d'Or, but they are less marrowy and have a less free taste. Burgundy is probably the oldest wine-growing country in central Europe, and that part which produces the best wines of this department has been called by the French Côte d'Or or "golden-hill-side." This is formed by a series of hills about thirty-six miles in length, which stretch from Chalon on the Saône to Dijon, in the direction of n.n.e. to s.s.w., their cultivated inclination and exposure being consequently towards the east. The black grape peculiar to the Bourgogne, the Pineau or Noirien, is the dominating vine along the Côte. Another variety which frequently occurs in Burgundy is a light red one called Beurot, known in Germany as Ruländer. Of white grapes there is the Chardenay, yielding among others the celebrated wine of Chablis. The best wines of Burgundy are distinguished by the suavity of their taste, their fineness, and spirituous aroma. The first growths of red wine are Romanée Conti, Chambertin, Richebourg, Clos Vougeot, Romanée de St. Vivant, Tâche, Clos St. Georges, and Corton, in the department of the Côte d'Or. The second class differ but little from those of the first, and generally take their place in commerce; this class includes the vineyards of Vosne, Nuits, Prémeau, Chambolle, Volnay, Pommard, Beaune, Morey, Savigny, Meursault, and others. Of the white wines the most celebrated are those of Montrachet, uniting body and strength with great fineness and bouquet.

The Champagne is an ancient province of France, situated under the 47th, 48th, and 49th degrees of latitude. At the division of France into departments it was cut up into four parts, which were respectively united with the departments of the Ardennes, the Marne, the Upper Marne, and the Aube. The wine to which this district owes its reputation is obtained not in all these departments, but only in that of the Marne, which includes the prefectures of Châlons-sur-Marne, Épernay, Rheims, Saint-Ménéould, and Vitry-sur-Marne. These districts contain 19,589 hectares of vineyards, which are situated on the territories of 453 communities and belong to 27,018 proprietors. An average vintage produces about 700,000 hectolitres. Of this, more than a quarter is drunk by the inhabitants themselves. Good wine, however, is produced only by the prefectures of Rheims and Épernay, and the manufactories of Champagne are obliged to draw their main supplies from them. The dominating vines in the Champagne are the black grape called plant doré, which is the same as the black Burgundy, and the meunier or miller. Another vine which occurs here and there is the marmot vert, identical with the elbing of the Moselle and the goix d'Orléans. The character of the effervescent champagne vines is derived mainly from the black Burgundy grape, with which in good years is mixed a certain quantity of the white Burgundy. The still champagnes are made—the red varieties from the black Burgundy only, and the white varieties from the white Burgundy only. Of the bottled wines which are produced in the Champagne, four varieties have to be distinguished. Champagne *non mousseux* is wine which has been fully fermented, fined, drawn into bottles, stopped in the usual manner of the mousseux wines, tied, and allowed to rest a long time. Champagne *crémant* forms a slight cream of effervescent bubbles upon its surface when it is poured into a glass. Champagne *mousseux*, when opened, projects the cork with an audible report and begins to rise gently over the margin of the bottle. Champagne *grand mousseux* projects the cork with a loud report, and immediately overflows from the bottle.

The wines of the Champagne are light, fine, and delicate; they are very heady, but the exhilaration produced by them does not last long, and they are mostly wholesome. Of superior white wines are the dry Sillery grown at Ludes, Mailly, Verzenay, and Verzy; the soft wines of Ay, Mareuil, Dissy, Pierry, Hautvilliers, and the vineyard of Clozet, at Épernay; they are distinguished for their lightness, delicacy, and agreeable taste. Next to these range the red wines of Verzy, Verzenay, Mailly, St. Basle, Bourzy, and Clos de St. Thierry in the Marne department.

The wines of the valleys of the Loire and Charente extend from the neighborhood of Orléans through an enormous plain towards Blois, and thence towards Angoulême and Poitiers, and further towards the Charente, into the district of Cognac. The vines most common in that district are the meunier or miller, the teinturier or dyer, and the auvernat noir. The best cognac is made from white varieties of vines, namely, the Folle blanche, the Boillot, the Blanc doux, Colombar, Sauvignon, and St. Pierre. Sometimes red grapes are taken for distillation, but their spirit does not possess the soft and agreeable properties which are peculiar to that obtained from white grapes. The varieties cultivated for red wine are Balsac, Maroquin, and Dégoutant. The quantity of brandy produced in the Charente is about 180,000 hectolitres. France, although on the whole it produces few liqueur wines, yields a quantity of very good wines, which bear comparison with most of those of other countries. Of the finer quality are those of Roussillon, Dauphiné, and Languedoc. See BORDEAUX, BURGUNDY WINES, CHAMPAGNE WINE, and WINE, *ante*.

FRENEAU, PHILIP, 1752-1832; b. New York; graduated at the college of New Jersey, 1771. At the age of 17, he wrote *The Poetical History of the Prophet Jonah*, and on the outbreak of the revolutionary struggle aided the cause by many patriotic songs and verses. He went, during the war, to the West Indies in the service of a mercantile house, and in 1780 was captured by the British, and confined in a prison ship at New York. His imprisonment did not abate the ardor of his patriotic verses. He subsequently made many mercantile voyages to the West Indies. He was one of the earliest American poets, and published several volumes of his pieces; and edited the *N. Y. Daily Advertiser*, the *National Gazette* of Philadelphia, the *Jersey Chronicle*, and the *Timepiece and Literary Companion*, issued in New York.

FRENTANI, a people in central Italy in the early ages, descended from the Samnites, but allies of Rome. They dwelt in a hilly region on the shores of the Adriatic sea.

FRÈRE, CHARLES THÉODORE, b. Paris, 1815; a painter, pupil of Coignet and Roqueplan; made his first exhibit in 1834. Two years later he went to Algeria, traversed the desert, visited the east, and was present at the fall of Constantine, Oct. 13, 1837. His favorite subjects for pictures were scenes from eastern life, but he occasionally produced military pieces. Small in size, his paintings are rich in color, accurate in design, and harmonious in execution. He twice received the medal—in 1848 and in 1865.

FRERE, SIR HENRY BARTLE EDWARD, nephew of John Hookham; b. England, 1815. In 1834, he entered the Indian civil service, and after holding some revenue appointments became, in 1842, secretary to sir George Arthur, then governor of Bombay. In 1856, he proceeded to Scinde, in the capacity of British president, and was made chief commissioner there in 1860. He was created a K.C.B. in 1859 in consideration of his service during the Indian mutiny, and the thanks of parliament were twice voted to him. In Mar., 1862, he was nominated governor of Bombay, whence he returned to England in 1867. He was created a knight grand cross of the order of the star of India, and was nominated a member of her majesty's Indian council at home. He long occupied the position of vice-president of the royal geographical society. In Oct., 1872, he was sent by the British government as special commissioner to e. Africa to inquire into the slave trade. Arriving at Zanzibar Mar. 12, 1873, he induced the sultan of Zanzibar to sign a treaty abolishing that traffic. Returning to England he was sworn a member of the privy council, and presented with the freedom of the city of London. Subsequently he visited India in the suite of the prince of Wales, and in Jan., 1877, was appointed governor of the cape of Good Hope, and high commissioner (for Great Britain) of s. Africa. During that year (1877) the Kaffer war occurred, and sir B. F. proceeded at once to British Caffraria, deposed the Galeka chief Krel, and annexed his country to the queen's dominions in s. Africa. This conclusion was carried into effect by a considerable exhibition of British force, and the rising temporarily suppressed. But in 1878 it again broke out with renewed strength. Other powerful chiefs combined with those already in insurrection, and what promised to become a most serious outbreak was only finally quelled by the display of great firmness and energy on the part of sir B. F., who was but ill supported in his efforts by the British ministry, but who was still occupying his post at the beginning of 1880.

Sir Bartle Frere is president of the royal Asiatic society, and a vice-president of the royal geographical society, and of the society for the propagation of the gospel in foreign parts. A biographical memoir of his uncle, the right Hon. John Hookham Frere, prefixed to his "Works," was written by him, and among his writings may be mentioned *Christianity suited to all Forms of Civilization*, a lecture delivered in connection with the Christian evidence society; *Indian Missions*, reprinted from *The Church and the Age*; *Pandurang Hari, or Memoir of a Hindoo*; and *Eastern Africa as a Field for Missionary Labor*.

FRERE, JOHN HOOKHAM, 1796-1841. At Eton college, in 1785, he contracted an intimacy with Canning, which greatly influenced his after-life. From Eton he went to Cambridge, where he graduated in 1795. He commenced his public career in the foreign office under lord Grenville, and from 1796 to 1802 represented a Cornish borough

in parliament. He warmly seconded Canning in the defense of Pitt's administration, and was an energetic contributor to the pages of the *Anti-Jacobin*. When Canning was appointed to the board of trade, he replaced him as under-secretary of state; in Oct., 1800, he was appointed envoy extraordinary and plenipotentiary to Lisbon; and, Sept., 1802, he was transferred to Spain, where he remained for two years. He was recalled on account of a personal disagreement, but his conduct was approved by the ministry, and in 1808, he was again sent out as plenipotentiary to Ferdinand VII. The condition of Spain rendered his position a very responsible and difficult one, yet had it not been for one unfortunate step he would have left the country with greatly increased reputation. When Napoleon began to advance on Madrid it became a matter of supreme importance to decide whether sir John Moore, who was then in the n. of Spain, should endeavor to anticipate the occupation of the capital or merely make good his retreat; and if he did retreat, whether he should do so by Portugal or by Galicia. Frere was strongly of the opinion that the bolder was the better course, and he persistently urged his views on sir John Moore. After the disastrous retreat to Corunna, the public accused Frere of having by his advice endangered the British army, and, though no direct censure was passed upon his conduct by the government, he was called home, and the marquis of Wellesley was appointed in his place. Thus ended Frere's public life. He afterwards refused to undertake an embassy to St. Petersburg, and twice declined the honor of a peerage. In 1816, he married Elizabeth Jemima, dowager countess of Erroll; and in 1820, on account of her failing health, he went with her to the Mediterranean. In quiet retirement he devoted himself to various literary labors, studied Greek authors, and taught himself Hebrew and Maltese. His hospitality was well known to many an English guest, and his charities and courtesies endeared him to his Maltese neighbors.

FRERE, PIERRE EDOUARD, b. France, 1819; a painter who worked in the studio of Paul Delaroche, and in 1843 exhibited his first picture in the salon. He received two third-class medals—in 1850 and 1855—and a second-class medal in 1852. At the close of the exposition of 1855, he was decorated with the cross of the legion of honor. He excelled in genre painting, and lithography has made his works popular and familiar to every one. Some of his paintings have found their way to America.

FRERON, LOUIS STANISLAS, 1763-1802; a French revolutionist. His name was, on the death of his father, attached to *L'Année Littéraire*, which was continued until 1790, and edited successively by the abbés Royou and Geoffroy. On the outbreak of the revolution, Freron, who was a school-fellow of Robespierre and Camille Desmoulins, established the violent journal, *L'Orateur du Peuple*. Commissioned with Barras in 1793 to establish the authority of the convention at Marseilles and Toulon, he distinguished himself equally with his colleagues in the atrocity of his reprisals, but both afterwards joined the Thermidoriens, and F. became the leader of the Jeunesse Dorée. He then made his paper the official journal of the reactionists, and being sent by the directory on a mission of peace to Marseilles, he published, in 1796, *Mémoire historique sur la Réaction royale et sur les Malheurs du Midi*. He died in St. Domingo, where he was for a few months sub-prefect.

FRESCOBALDI, GIROLAMO, 1587-1654; a composer of music, b. at Ferrara, of whose life little is known. It is supposed that he went to Belgium, at that time still a center of art, where he is said to have lived till 1608, after which period he appears to have settled in Italy, at first in Milan, and in 1627 in Rome, where three years later he obtained the office of organist of St. Peter's church. At this period he had acquired great fame as a virtuoso on the organ, and according to Baini no less than 30,000 people flocked to St. Peter's on his first appearance there. He also excelled as a teacher, Froberger, the celebrated organist, and precursor of Bach, being the most distinguished of his pupils. Frescobaldi's compositions show the consummate art of the early Italian school, and his works for the organ especially are full of the finest devices of fugal treatment. He also wrote numerous vocal compositions, such as canzones, motets, hymns, etc., a collection of madrigals for five voices being among the earliest of his published works.

FRESENIUS, KARL REMIGIUS, b. Germany, 1818; a chemist and assistant of Liebig. In 1845, he was professor of chemistry at Wiesbaden. In 1862, he founded the *Zeitschrift für Analytische Chemie*. He is the author of valuable works on the mineral springs of Germany. His most important publications are *Anleitung zur Qualitativen Chemischen Analyse*, and *Anleitung zur Quantitativen Chemischen Analyse*: the former having reached a 13th ed., and the latter having been translated into English.

FRESNO, a co. in central California between the Sierra Nevada and the coast range of mountains, intersected by the San Joaquin, Fresno, and King rivers, and the Central Pacific railroad; area, 8,750 sq. m.; pop. '70, 6,336. The surface is rough but fertile, and there are rich mines of quicksilver and of silver. Co. seat, Millerton.

FREUND, WILHELM, b. 1806; a German lexicographer of Hebrew descent, educated in Berlin, where he opened a Hebrew school. He assumed the direction of schools in various places. He has published several works, the most important being his

Wörterbuch der Lateinischen Sprache, from which Andrew's Latin lexicon is mostly compiled.

FREYCINET, LOUIS CLAUDE DESAULSES DE, 1779-1842; an officer of the French navy and a noted navigator. He took part in several engagements against the English, and, in 1800, he joined with his brother Henry Louis, who afterwards rose to the rank of admiral, the expedition sent out under capt. Baudin in the *Naturaliste* and *Géographie* to explore the s. and s.w. coasts of Australia. Much of the ground already explored by Flinders was revisited, and new names imposed by this expedition. In 1806, Louis returned to Paris, and was intrusted by government with the work of preparing the maps and plans of the expedition. In 1817, he commanded the *Uranie*, in which Arago and others went to Rio de Janeiro, to take a series of pendulum measurements. This was only part of a larger scheme for obtaining observations, not only in geography and ethnology, but in astronomy, terrestrial magnetism, and meteorology, and for the collection of specimens in natural history. For three years Freycinet cruised about, visiting Australia, the Marianne, Sandwich, and other Pacific islands, South America, and other places, returning to France, notwithstanding the loss of the *Uranie*, with fine collections in all departments of natural history, and with voluminous notes and drawings which form an important contribution to a knowledge of the countries visited. The results of his voyage were published under Freycinet's supervision, with the title of *Voyage Autour du Monde*, etc.—[From *Encyc. Brit.*, 9th ed.]

FREYTAG, GEORG WILHELM FRIEDRICH, 1788-1861; b. Germany, and educated at Göttingen in philology and theology. From 1811-13, he acted as tutor there; but at the end of 1813, became sub-librarian at Königsberg. In 1815, he accepted the office of chaplain in the Prussian army, and in that capacity visited Paris, where he had ample opportunities for the cultivation of his favorite oriental studies. On the proclamation of peace he resigned his chaplaincy, but, with the sanction and support of his government, continued his researches in Arabic, Persian, and Turkish at Paris, under De Sacy. In 1819, he was appointed to the professorship of oriental languages in the recently established university of Bonn, and this post he continued to hold until his death. He edited two volumes of Arabic songs and three of Arabic proverbs. But his principal work was the laborious and praiseworthy *Lexicon Arabico-Latinum*, which rapidly superseded the earlier lexicons, and which remained long in current use as embodying the best results of the labor of De Sacy and his school.

FRIDAY, the sixth day of the week. In the Roman Catholic and some of the eastern churches, all Fridays except Christmas are obligatory fast days in memory of the crucifixion of Christ, which is commemorated on what is called Good Friday. In some Roman Catholic communities Fridays in Advent are exempt from this rule. Ember day in Advent, however, is always a fast. The superstition that Friday is an "unlucky day" may probably be traced to the early Christian celebrations in memory of the crucifixion. See DAYS, UNLUCKY.

FRIEDLÄNDER, DAVID, 1750-1834; b. Prussia; a Hebrew scholar, who became a leader of the Jews at Berlin in various reforms. He proposed to the Prussian ecclesiastical authorities the admission of Jews to the Christian church without their acknowledgment of the divinity of Christ, but his proposition was not favorably received, though its discussion produced a literature of considerable extent. He established a free school for the Jewish youths at Berlin, and labored long and earnestly for the advancement of his race.

FRIEDRICH, JOHANN, b. Germany, 1836; a German theologian, ordained a Roman Catholic priest in 1859; in 1865, professor of theology in the university of Munich, and in 1869 a member of the academy of sciences. The most noticeable of his works is the *Kirchengeschichte Deutschlands*. He contributed a great many articles to the *Allgemeine Zeitung*, in which he advocated principles adverse to the Vatican, for which he was excommunicated and formally suspended. The latter being adverse to the Roman church, he with Döllinger received the major excommunication. He has published several other works opposed to the extreme pretensions of the papacy.

FRIENDS OF GOD, a small body of religious reformers of the 14th c., who labored for the reformation of the church while continuing their adherence to it. Their principal leader was Nicholas of Bâle. Tauler, the great Dominican mystic, was one of this brotherhood. Sympathizing to some extent with the "Brethren of the Free Spirit," they nevertheless avoided the fanaticisms ascribed to that body.

FRIENDS, PROGRESSIVE, a society formed in Pennsylvania in 1853, the result of a division among the regular Friends on questions of progress and reform. The new organization embraced all who advocated the equality of the human family, and recognized that their faith in God called for more than the mere assertion of creeds, and necessitated lives of benevolence and charity. The friends did not insist upon similarity of theological opinions, but based their principles upon unity of spirit in the practical matters of every-day life, and their mutual admiration for the pure and holy. They were not advocates of any kind of discipline or restraint, but opposed all churches alike on principle, considering it imposture to claim that they were in such relation to the

Deity as to speak by his authority. This sect flourished for a time, but is now almost forgotten.

FRINGE OF THE GARMENT, an appendage worn by the Israelites on the edges and especially at the corners of their robes. It was originally enjoined on them by Moses, in accordance with divine direction, as a memento of God's commandments, which they were required continually to obey: Num. xv. 38-41. Originally this fringed or tasseled garment was the large outer one; but after the Jews were scattered abroad in other lands, and persecuted therein, wishing to conceal rather than display their nationality, they wore their fringes on a smaller inner robe. This is often called simply "the fringes," and is worn by every orthodox Jew. Many of them wear also a fringed outward garment during their attendance on morning prayer. As the wearing of this fringe was an external act of obedience, easily performed, the Jews gradually attached more and more importance to it, and, forgetting that it was simply a reminder of duty, they at length regarded it as, in itself, the one great duty which included all others. In the Talmud one rabbi asks another, "Which commandment has your father admonished you to observe more than any other?" and the answer is: "The law of the fringes." Some of the rabbins say that "this law is as important as all the other laws put together;" that "whoso diligently keeps it is made worthy, and shall see the face of the majesty of God;" and that "when a man, clothed with the fringe, goes out to the door of his habitation, he is safe. God rejoiceth, the angel of death departeth, and the man shall be delivered from all hurt." Knowledge of the inordinate importance so generally ascribed to the mere appendage of a dress illustrates clearly the force of the Savior's judgment concerning the Pharisees, "All their works they do to be seen of men: they make broad their phylacteries and enlarge the fringes of their garments." It explains also the fact, that, in the opinion of the people, the hem (properly fringe) of Christ's garment represented the fullness of the power which, they believed, dwelt within him; so that a woman in the throng around him secretly touched the fringe of his garment, and many other persons begged the privilege of touching it, as being all that they needed to do in order to be healed.

FRIIO, a co. in s. Texas, intersected by the Frio river, 1050 sq. m.; pop. '80, 2,130—65 colored. It is devoted chiefly to cattle-raising. Co. seat, Frio Town.

FRISI, PAOLO, 1728-87: an Italian monk, professor of morals and metaphysics at Milan; in 1756, professor of mathematics in Padua; and in 1764, mathematical professor at the university of Milan. He excelled as a mathematician, but his very positive character involved him in continual disputes. His works include a *Disquisitio Mathematica*, upon the physical cause of the earth's figure and motion; *De Atmosphaera Caelestium Corporum*; *De Inaequalitate motus Planetarum*; *Del Modo di Regulare i Fiumi e i Torrenti*; and others.

FRISIANS (ante). The Frisian language belongs to the Low German branch of the Teutonic, and presents special interest to the English philologist as the nearest of all extant forms to the Saxon basis of his own tongue. It is still spoken in the country districts of the present province of West Friesland; in a much more Germanized condition it still exists in Saterland, in East Friesland; in strangely differentiated dialects it holds its place in many of the islands along the coast; and, in spite of the encroachments of Low German on the one hand, and Danish on the other, it survives in the country between Husum and Tondern. Among its peculiarities may be mentioned the dropping of the final *n*, which is such a favorite termination in German (thus even *man* for *man*, as in Halbertsma, the proper name); the use of *sk* for the German *sch* and the English *sh*, and of *t* for the German *k*; and, still more remarkable, the modification of *k* and *g* to *ts* when these letters precede *e* or *i*, as in *tserke* for *kerke*, i.e. kirk, church. The explanation of this last peculiarity may perhaps be found in the contact of the Frisian with Slavonic languages, in which the modification is sufficiently common. A brief sketch of Frisian grammar was published with the poems of Gysbert Japicx; but the first separate treatment of the older forms of the language was by Rask, whose *Frisisk Sproglaere* brought him into controversy with Grimm, who, in his *Deutschen Grammatik*, devoted some attention to the same subject. Moritz Heyne has also given a good treatment of Frisian in his *Kurze Laut- und Flexionslehre der Altgermanischen Sprachstamme*. Richthofen's *Altfriesisches Wörterbuch* practically supplanted the older work of Wiarda, and its position has not been affected by the publication of Haan Hattema's *Idioticon Friesicum*. The *Ostfriesisches Wörterbuch*, by Sturenburg, is a dictionary, not of the Frisian, but of the Low German spoken in East Friesland, which has incorporated comparatively few Frisian words.

For the older forms of the language the sources are scanty; no great literary monument like that of the *Heliand* or the *Nibelungenlied* has been preserved; and the investigator has mainly to depend on the various legal codes or collections which were formed in the course of the 14th and 15th centuries, and have been published by Richthofen, *Friesische Rechtsquellen*. The great *Lex Friesionum* is composed in Latin, and contains only a few Frisian terms, of comparatively small linguistic importance. The date of its recension is also a matter of conjecture, as there is no contemporary evidence either internal or external. By the older investigators it was assigned a high antiquity; but the more modern are for the most part of the opinion that it is not earlier than the reign of

Charlemagne. Haan Hetteema, in his *Oude Friesehe Wetten*, gives 802-4 as the probable date; while Richthofen thinks there are three portions: the first composed for use in Middle Frisia in the reign of Charles Martel or of Pippin; another for use in all Frisia, composed after Charlemagne's conquest in 785; and a third or supplementary and emendatory portion, composed in 802. The first edition of the *Lex Frisonum* was published by B. J. Herold in his *Originum ac Germanicarum Antiquitatum Libri*, but he gives no indication of the source of the manuscripts which he employed. Since his day there have been no fewer than 13 editions. Though it has been supposed that Lindenbrog and Siccama may have had access to some manuscript authority in addition to Herold's recension, there is no proof that such was the case; and the text still remains to all intents in the same state as when Herold left it. Some investigators have, owing to this absence of original evidence, even cast doubts on the authenticity of the code, but a comparison of the laws with undoubtedly genuine Frisian remains authorizes its acceptance. In West Frisia the native language holds much the same relation to Dutch as the Scottish language holds to English in Scotland; it has no legal or educational position, but it preserves among the peasantry a considerable vitality, and is even cultivated in a literary way by a small patriotic school. The chief place among West Frisian authors is due to Gysbert or Gilbert Japicx, rector at Bolsward, whose *Friesehe Rymterge* was published in 1668, and has since been frequently reprinted, with a glossary by Epkema. The volume contains secular, and especially humorous, poems, fifty of the psalms of David, and other religious pieces, a number of letters, one or two prose essays, and fragments of the *Customs* of Leeuwarden. There is one book which, more than any other, has attracted the attention of other than Frisian scholars. If the *Oera Linda* book, as it is called, could be accepted as genuine, it would be, after Homer and Hesiod, the oldest document of European origin; but unfortunately it must be recognized as nothing more than a brilliant forgery. The first part of the manuscript, the book of the followers of Adele, professes to have been copied in 1256 from an ancient original, and gives an account of Neptune, Minerva, Minos, and other personages of classical antiquity, which would make them out to be of Frisian origin. According to J. Beckering Vinckers, the real author is Cornelis Over de Linden, a ship-carpenter in the royal docks at Den Helder, who was born in 1811, and died in 1873, and who appears to have forged the document for the purpose of giving importance to his invectives against the church, and of conferring dignity on his family, which is traced by the book back for about two thousand years. [Condensed from *Encyc. Brit.* 9th ed.]

FRITH, or FRYTH, JOHN, 1503-33; b. in Kent; one of the pioneers of the reformation in England; educated at Eton and at Cambridge, where Gardiner, subsequently bishop of Winchester, was his tutor. Immediately after taking his degree, invited by Wolsey, he transferred his residence to the newly-founded college of St. Frideswide, or Cardinal college (now Christ's church), Oxford. Suspected of sympathy with the reformation, he was imprisoned for some months. At the instance of Wolsey he was released from confinement in 1526 or 1527, and fled to the continent, where he resided chiefly at the newly-founded Protestant university of Marburg, and was associated with Tyndal in literary labors. At Marburg he became acquainted with several scholars and reformers of note, and particularly with Patrick Hamilton. His first publication in fact was a translation of Hamilton's *Places*, made shortly after the martyrdom of their author; and soon afterwards appeared, with other works from his hand, *A Pistle to the Christen Reader*, by Richard Brightwell (supposed to be by him); *An Antithesis wherein are compared togeder Christes Actes and our Holye Father the Popes*, dated "at Malborow in the lande of Hesse;" and *Disputacon of Purgatorye*, a treatise in three books, respectively against Rastell, sir T. More, and Fisher (bishop of Rochester). In 1532, in July or Aug., he ventured back to England, apparently on some important business, to which he and Tyndal attached importance in connection with the prior of Reading. Warrants for his arrest were almost immediately issued at the instance of sir T. More, then lord chancellor. After evading pursuit for some weeks, he fell into the hands of the authorities, as he was on the point of making his escape to Flanders. The rigor of his imprisonment in the Tower was abated when sir T. Audley succeeded to the chancellorship, and it was understood that both Cromwell and Cranmer were disposed to leniency. But the treacherous circulation of a manuscript, *Lyttle Treatise on the sacraments*, which Frith had written for the information of a friend, with no view to publication, further excited the hostility of his enemies; and in a Lenten sermon preached against the "sacramentaries" before the king, special reference was made to some at that time in the Tower, "so bold as to write in defense of that heresy," and who seemed to be put there "rather for safeguard than for punishment." On this instigation, F. was tried, and found guilty of denial that the doctrines of purgatory and transubstantiation were necessary articles of faith. June 23, 1533, he was handed over to the secular arm, and was burnt at Smithfield, July 4. During his captivity he had been busy with his pen, writing a controversial work on the eucharist, and two tracts, entitled respectively *A Mirror or Glass to know thyself*, and *A Mirror or Looking-glass wherein you may behold the Sacrament of Baptism*. Apart from his extraordinary ability, his acquirements, his piety, his early and tragic death, Frith is an interesting and important figure in English ecclesiastical history, as the first to maintain that doctrine regarding the sacrament of Christ's body and blood which ultimately came to be incorporated in the English communion

office. Twenty-three years after Frith's death as a martyr to the doctrine of that office, that "Christ's natural body and blood are in heaven, not here." Cranmer, who had been one of his judges, went to the stake for the same belief. Within three years more, it had become the publicly-professed faith of the English nation. [*Encyc. Brit.*, 9th ed.]

FROBEN, or FROBENIUS, JOANNES, 1460-1537; a German scholar and printer, educated at the university of Bâle. He was the first German who brought the art of printing near perfection. He was on intimate terms of friendship with Erasmus, who not only had his own works printed by him, but superintended Frobenius's editions of St. Jerome, St. Cyprian, Tertullian, Hilary of Poitiers, and St. Ambrose. It was part of his plan to have printed also editions of the Greek fathers. He did not live to carry out this project, but it was very creditably executed by his son Jerome and his son-in-law. An extant letter of Erasmus, written in the year of Frobenius's death, gives an epitome of his life and an estimate of his character; and in it Erasmus mentions that his grief for the death of his friend was far more poignant than that which he felt for the loss of his own brother. The epistle concludes with an epitaph in Greek and Latin.

FROEBEL, FRIEDRICH WILHELM AUGUST, 1782-1852; a German philosopher, philanthropist, and educational reformer. He was the son of a priest, and lost his mother while in infancy. An uncle gave him a home and sent him to school; but he was a strange child, and passed for a dunce; so while his half-brother was sent to the university, F. was apprenticed to a forester. In the grand Thuringian forest his study of nature, despite the absence of scientific instruction, gave him a profound insight into the laws of the universe, strengthened his inborn tendency to mysticism; and when at the age of 17 he left the forest, he seemed to have been possessed by the main ideas which influenced his after-life. He was too poor to study in the university, although he tried it for a few months, returning home with dark prospects. When he was 20 years old his father died, and he was left to take care of himself. For more than three years he tried one thing and another, satisfied with nothing, but always believed that he had some great work to do; and at last, while studying architecture in Frankfort, he became acquainted with the director of a model school who had caught some of the enthusiasm of Pestalozzi. He took a place in the school, and worked with success for two years. Then undertaking the education of three boys in one family, he took them to Yverdon, near Neuchâtel, forming with them a part of the celebrated institution of Pestalozzi. Here, taking the results at which Pestalozzi had arrived through the necessity of his opinion, F. developed their principles by deduction from the nature of man. In 1811, he began study at Göttingen; but again was interrupted, this time by the king of Prussia's celebrated call "to my people." Though not a Prussian, he enlisted and went through the campaign of 1813. While he did his duty as a soldier, he carried in his thoughts his future calling as an educator. After the peace of 1814, Froebel became curator of the museum of mineralogy in Berlin. Learning that his brother's widow in a village on the Ilm was in trouble, F. gave up his post and set out on foot to assist her. He spent his last groschen on the way for bread. He undertook the education of his orphan niece and nephews, and of the nephews sent by another brother, and with these children opened a school in the village of Keilhau, in Thuringia. Froebel, with his friends Langenthal, Middendorff, and Barop, a relative of Middendorff's all married, and formed an educational community. The little school increased, though its founders were often in straits for money, and sometimes even for food. In his conferences with young Swiss teachers sent to him by the government on the occasion of his being in Lucerne, he found that the schools suffered from the state of the raw material brought into them. Until the school age was reached, the children were entirely neglected. His conception of harmonious development naturally led him to attach much importance to the earliest years, and his great work on the *Education of Man*, published in 1826, deals chiefly with the child up to the age of seven. At Burgdorf, where he had these young teachers for pupils, his thoughts were much occupied with the proper treatment of young children, and in scheming for them a graduated course of exercises, modeled on the games in which he observed them to be most interested. In his eagerness to carry out his own plans he became impatient of official restraints; so he returned to Keilhau and soon afterwards opened the first "kindergarten" or "garden of children," in the neighboring village of Blankenburg in 1837. In 1849, he attracted within the circle of his influence a woman of great intellectual power, the baroness von Marenholtz-Bülow, who, in her *Recollections of Friedrich Froebel*, has given us the only life-like portrait we possess. It seemed that those were to be Froebel's most peaceful days. He had become a widower; and now, marrying again, he began the education of young women for teachers. But trouble came upon him from an unexpected quarter. His nephew Karl had published books advocating theories widely different from those of F., and which were deemed socialistic. The distinction between the two men was overlooked, and in the reaction which soon set in after the year of revolutions, 1848, F. found himself suspected of socialism and irreligion; and in 1851 the "cultus-minister" Raumer issued an edict forbidding the establishment in Prussia of schools "after Friedrich and Karl Froebel's principles." This was a heavy blow to the old man, who had looked to the government of the "Cultus-staat" Prussia for support, but was met with denunciation. The charges brought

against F. were absurdly untrue. Whether from the worry of this new controversy, or from whatever cause, F. did not long survive the decree. His 70th birthday was celebrated with great rejoicings in May, 1852, but he died in the following month, and lies buried at Schweina, a village near his last abode, Marienthal.

"All education," says Froebel "not founded on religion is unproductive." This conviction followed naturally from his conception of the unity of all things, a unity due to the original Unity whence all proceed and in whom all "live, move, and have their being." "All has come forth from the divine, from God, and is through God alone conditioned. To this it is that all things owe their existence, to the divine working in them. The divine element that works in each thing is the true idea of the thing." "The destiny and calling of all things is to develop their true idea, and in so doing to reveal God in outward and through passing forms." "In the creation, in nature and the order of the material world, and in the progress of mankind, God has given us the true type of education." As the cultivator creates nothing in the trees and plants, so the educator creates nothing in the children—he merely superintends the development of unborn faculties. So far F. agrees with Pestalozzi; but in one respect he went beyond him, and has thus become, according to Michelet, the greatest of educational reformers. Pestalozzi had said that the faculties were developed by exercise, F. added that the function of education was to develop the faculties by arousing *voluntary activity*. Action proceeding from inner impulse was the one thing needful. And here Froebel, as usual, refers to God. "God's every thought is a work, a deed." As God is the Creator, so must man be a creator also. "He who will early learn to recognize the Creator must early exercise his own power of action with the consciousness that he is bringing about what is good, for the doing good is the link between the creature and the creator, and the conscious doing of it is the conscious connection, the true living union of the man with God, of the individual man as of the human race, and is therefore at once the starting-point and the eternal aim of all education." Again he says: "The starting point of all that appears, of all that exists, and therefore of all intellectual conception, is act, action. From the act, from action, must therefore start true human education, the developing education of man; in action, in acting, it must be rooted and must spring up. . . . Living, acting, conceiving—these must form a triple chord within every child of man, though the sound now of this string, now of that, may preponderate, and then again of two together." F. held with Rousseau that each age has a completeness of its own, and that the perfection of the latter stage can be attained only through the perfection of the earlier. Impressed with the immense importance of the first stage, F., like Pestalozzi, devoted himself to the instruction of mothers. But he would not, like Pestalozzi, leave the children entirely in the mother's hands. Pestalozzi held that the child belonged to the family, Fichte, on the other hand, claimed it for society and the state. Froebel, whose mind delighted in harmonizing apparent contradictions, and who taught that "all progress lay through opposites to their reconciliation," maintained that the child belonged both to the family and to society and he would therefore have children spend some hours of the day in a common life and in well-organized employments. These assemblies of children he would not call schools; for the children in them ought not to be old enough for schooling. So he invented the name "*kindergarten*," garden of children, and called the superintendents "children's gardeners." He laid great stress on every child cultivating its own plot of ground, but this was not his reason for his choice of the name. It was rather that he thought of these institutions as inclosures in which young human plants are nurtured. In the kindergarten the children's employment should be play. But any occupation in which children delight is play to them: and Froebel invented a series of employments which, while they are in this sense play to the children, have nevertheless, as seen from the adult point of view, a distinct educational object. [Condensed from *Encyc. Brit.* 9th ed.] See *KINDERGARTEN*, *ante*.

FROEBEL, JULIUS, b. 1806; a German writer and politician, nephew of Friedrich. After studying at Rudolstadt, Keilhau, Stuttgart, Munich, Weimar, and Berlin, Julius was appointed to the chair of philosophy and natural history at Zurich. Subsequently, he officiated in the high school of that town as professor of mineralogy. Having become a naturalized citizen of Switzerland in 1826, he took part in politics, in the interest of the extreme radical party, and edited *Der Schweizerische Republikaner*. He established a publishing house at Zurich, and, devoting himself exclusively to this establishment, he relinquished his professorship in 1844, and issued several scientific works and many political pamphlets, which found many readers. Some of his works were suppressed by the government. Having returned to Germany, he was expelled from the Prussian territory, and took up his abode in Dresden until the revolution of 1848, when he became a popular leader of the democrats, and a member of the German parliament at Frankfort-on-the-Main. He accompanied Robert Blum to Vienna, and was arrested, but acquitted by the same court-martial which pronounced the sentence of death upon his unfortunate friend. After the dissolution of the parliament he came to the United States, lectured in New York on German politics, engaged in commercial pursuits there, went, in 1850, to Nicaragua, and afterwards engaged in one or two commercial expeditions to Santa Fé and Chihuahua. In 1855, he edited a journal at San Francisco; and in 1857.

after his return to Germany, he was expelled from Frankfort, and went to reside in London. In 1862, he was an editor in Vienna; and in 1873, was made German consul at Smyrna. Among his works, which include many on geography and politics, are: *System der Socialen Politik*; *Die Republikaner*, an historical drama in five acts; and *Aus Amerika, Erfahrungen, Reisen, und Studien*, translated into English, under the title of *Seven Years' Travel in Central America, Northern Mexico, and the Far West of the United States*.

FROG-SPAWN, the popular name of certain fresh-water algæ which make green and slimy masses on the surface of streams. The name is applied properly to the gelatinous mass inclosing the ova of frogs.

FROG-SPITTLE, a frothy substance appearing on weeds, grasses, etc., much resembling human spittle in general appearance. It contains grubs of insects of certain families of the *hemiptera*. The froth is generated by the sap of the plant.

FROMENTIN, ELIGIUS, d. New Orleans, 1822; a native of France, a priest and Jesuit, who settled in New Orleans, and soon after the organization of the state of Louisiana was chosen senator in congress. When Jackson was governor of the territory of Florida, F. was U. S. judge for the district.

FROMENTIN, EUGÈNE, b. 1820; a French author and painter, who studied under Cabat, and began to exhibit in 1847. In 1852, he was sent to Algeria on an archæological journey by the committee of historical monuments. He has produced many pictures of Arab life and scenery, which have been highly praised. Among them are "Chase of the Gazelles;" "Falcon Chase;" and "Arabian Falconer." He has published three or four works on art, and *Dominique*, a novel, which met with a fair measure of success.

FRONTAL BONE, one of the eight bones of the cranium. See **SKULL**.

FRONTENAC, a co. in the province of Ontario, Canada, bordering on lake Ontario, where it merges into the St. Lawrence river; traversed by the Grand Trunk and the Kingston and Pembroke railways, and the Rideau canal; 323 sq. m.; pop. '71, 28,717. The capital is Kingston.

FRONTENAC, LOUIS DE BUADE, *Compte de*, 1620-98; governor of the French province of Canada. He entered the military service, and became col. at the age of 17 and lieutenant at 29, having distinguished himself greatly. He studied the science of warfare under Maurice of Nassau, served in Italy, Flanders, and Germany; and was selected by Turenne to head the troops sent to relieve Canada. He succeeded Courcelles as governor in 1672, built fort Frontenac or Catarocow (Kingston) in 1673, but, on account of some arbitrary acts, was recalled in 1682. He encouraged and aided La Salle in colonizing the Mississippi valley, and by posts at Niagara and Mackinac, and in Illinois, assailed the English settlements, and controlled the Indians. Reappointed in 1688, when insufficient resources had brought the colony to the brink of ruin, he carried on a vigorous war against the English settlements in New York and their Indian allies, the Iroquois, who made several successful inroads to Canada. In 1690, he defeated admiral Phipps and the English fleet before Quebec, in commemoration of which Louis XIV. caused a medal to be struck. Frontenac followed up this success by invading the Mohawk country, and leading an expedition in person against Onondaga and Oneida; while on the coast he menaced Maine and New York. He struck terror into the hearts of the Iroquois; and his energy was equal to his bravery. His wife, who survived him, had been one of the beauties of the French court, and used the influence she possessed against her husband, whom she seems to have cordially hated.

FRONTIER, a co. in s.w. Nebraska, drained by tributaries of the Republican river; about 900 sq. m.; pop. '76, 243. The surface is undulating, but the soil is unfitted for agriculture, and there is very little timber.

FROSSARD, CHARLES AUGUSTE, b. France, 1807; educated in the military school at Metz, and entered the army in 1827. He was engaged in the Belgian war, and in Algeria, where he became a major. In the Crimean war, he was in command of the 2d corps of engineers. In the Italian war, he was made a gen., and at the establishment of peace, he was made an officer of the legion of honor, and appointed governor of the imperial prince. In the war with Germany, he commanded the 20th corps of the army of the Rhine, and headed the attack upon Saarbruck. He was taken prisoner at Gravelotte, and detained until the close of the war.

FROST, JOHN, LL.D., 1800-59; b. Maine; graduated at Harvard, and taught in Boston and Philadelphia. He published a great number of works, comprising school and juvenile books, and historical and biographical compilations, amongst others *Pictorial History of the United States*; *Picture History of the World*; *Lives of American Generals*; *Lives of American Naval Commanders*; *Books of the Army*; *Books of the Navy*; etc.

FROST. In a general sense, frost means the lowering of atmospheric temperature at the surface of the earth to or below the freezing point, 32° F. In a special sense, the term is used to signify the deposition of atmospheric moisture upon plants and other objects. It is usually stated that frost is formed by the deposition of frozen dew, which indicates that the dew is frozen before it is deposited. This is not strictly correct. It

could not so be deposited in the perfect form that frost assumes. The freezing takes place at the moment of deposition of the moisture, before *dew* is formed, the surface of the object having been cooled slightly lower than the atmosphere by radiation into clear space; for a clear atmosphere, as a rule, is one of the conditions of the appearance of hoar-frost, as deposited "frost," or frozen deposited moisture, is called. It will be seen that this phenomenon requires a temperature not far below the freezing point, else the moisture will be deposited in the form of snow, or of a *very imperfect* hoar-frost. The perfection of the crystallization requires that it take place at the point of deposit.

Frost may appear suddenly without a crystalline deposit when the air is not very moist. From its effect upon vegetation, which it withers and turns dark, it is then called *black frost*. It may take place when the sky is cloudy; but clouds, because they retard the radiation of heat from the surface of the earth, generally retard or prevent the appearance of frost. A sheet placed horizontally over a bed of plants, even at some height, will often protect them from frost. A considerable amount of atmospheric moisture will often retard radiation sufficiently to avoid freezing. Some places are peculiarly favorable to the deposition of hoar-frost, and sometimes it forms in very large crystals. This is the case at Mt. Washington, when there is in some favorable locations so nice a balance between the moisture and the cold that crystals sometimes form a foot in length. A certain degree of cold will destroy the life, or at least the activity, of many species of disease germs; and it is a popular belief that the appearance of frost causes the disappearance of yellow and other fevers. This is the common belief in regard to the Mississippi valley; but in 1873, the appearance of frost did not check the fever there, probably because the cold was not sufficient. A certain elevation of temperature will undoubtedly kill all disease germs, and a certain depression will either kill them or render them innocuous. See RADIATION, SNOW, RAIN, and VAPORIZATION.

FROST, WILLIAM EDWARD, b. England, 1810; an English painter, chiefly of portraits. In 1839, he exhibited "Prometheus Unbound," for which he received the academy's gold medal. In 1843, he won a competition prize by his cartoon "Una alarmed by the Fawns." Among his works are the "Bacchanalian Revel" and "Disarming of Cupid."

FROSTBURG, a village in Alleghany co., Md., on the Cumberland and Piedmont railroad, on a plateau 1255 ft. above Cumberland river, over the great coal basin of western Maryland; pop. about 3,500. It has a number of manufactories, but is important chiefly on account of its large operations in coal.

FROTHINGHAM, ELLEN, daughter of Nathaniel L.; b. Boston, 1835; is distinguished for her thorough acquaintance with the German language and literature, and for her admirable translations of Lessing's *Nathan der Weise*, Goethe's *Hermann and Dorothea*, and Lessing's *Luconon*.

FROTHINGHAM, NATHANIEL LANGDON, D.D., 1793-1870; b. Boston; graduated at Harvard, where he was professor of rhetoric and oratory. In 1815, he was ordained pastor of the First church (Unitarian) in Boston, which position he occupied until 1850, when he left the pulpit, and devoted himself to literature. He published *Sermons in the Order of a Twelve-month*, and *Metrical Pieces*, translated and original. He also contributed largely to periodical literature. He was a thorough student of German, when such scholarship was rare in America; and his writings, especially his poetical translations, show a refined taste and an elegant diction.

FROTHINGHAM, OCTAVIUS BROOKS, b. Boston, 1822; an American clergyman, son of Nathaniel L. He graduated at Harvard college in 1843, at the Cambridge divinity school in 1846, and was settled as pastor of the North church (Unitarian), Salem, Mass., in 1847. In 1855, he became minister of a church of the same denomination in Jersey city, N. J., where he remained four years. In 1859, he accepted a call to the pastorate of the newly formed Third Unitarian Congregational church in New York, and remained at that post for 20 years, when ill-health compelled his resignation. From the beginning he belonged to the most radical wing of the Unitarian sect, and the name of his church was finally changed from the "Third Unitarian" to the "First Independent Liberal church of New York," the connection with the Unitarian denomination being thereby sundered. F. was one of the founders of the "free religious association," and its president for the first twelve years of its existence. His theology is of the rationalistic type. He ranks high as a scholar, and as a preacher is impressive and eloquent. He has contributed largely to the periodical press on a great variety of subjects, and published more than 200 sermons. He is the author of the following works: *The Parables; Stories from the Testament*; a translation of *Renan's Critical Essays*; *The Child's Book of Religion*; *The Religion of Humanity*; *The Life of Theodore Parker*; *The Safest Creed*; *History of Transcendentalism*; *Stories from the Lips of the Teacher*; *Stories of the Patriarchs*; *Beliefs of the Unbelievers*; *Life of Gerrit Smith*.

FROTHINGHAM, RICHARD, JR., b. Mass., 1812; for many years member of the editorial staff of the *Boston Post*. He represented Charlestown in the state legislature for five sessions, and was three times chosen mayor of that city. In 1853, he was a member of the state constitutional convention. He has published *History of Charlestown*; *History*

of the Siege of Boston; and the Battles of Lexington, Concord, and Bunker Hill; Account of the Bunker Hill Monument; Life of Gen. Joseph Warren; and Rise of the Republic.

FROZEN WELLS are common in the extreme northern United States. One in Brandon, Vt., 35 ft. deep, shows a mass of frozen gravel 15 ft. thick, congealing 14 ft. below the surface. Even in summer the walls are covered with ice several inches thick, and the temperature is seldom above the freezing point. The water freezes over in winter.

FRUIT (*ante*). The wild grape of New England would appear to be the first fruit authentically recognized as indigenous to the American soil. During the early explorations of the country undertaken by the Northmen, a German who accompanied them became greatly interested upon finding a fruit which recalled the vines of his native land. As the civilization of the country progressed, other fruits were imported by the settlers from different European countries. The French and Spanish missionaries, as they established churches, monasteries, and convents, brought their favorite home productions to the country of their adoption. In every district peopled by them, the cultivation of the soil repaid them with abundant fruit harvests. The early settlers in Virginia imported apples, pears, plums, and the hardy varieties of English fruits; while the Germans and French introduced the European vine stocks. California owes the abundant vintage of to-day to the enterprise of the Jesuits, whose followers paid great attention to the cultivation of the vine. From the middle of the 17th c., increasing attention was paid by the intelligent portion of the communities to the culture of fruit, but there is no authentic record of the establishment of nurseries for the exclusive rearing of fruit trees until the end of the year 1800, when they were estimated at four or five. It is difficult to arrive at any authentic statistics of this branch of enterprise, for no reliable record has been kept by any of the states, with the one exception of Michigan, which in 1874 returned a statement as to its orchards and the fruit harvest of that year, in which their money value was estimated at \$3,537,278, and the revenue from the grape-vine alone as \$22,015. Considering this estimate, and deducing from it an approximate idea of the relation of the fruit crop to the extent of the country, we can, by considering the climate and fruit-growing facilities of the other states in relation to their area, gather what may be taken as a fair estimate of the revenue derived from the cultivation of fruit throughout the union. We arrive at the conclusion, that the sum of \$46,724,293 may fairly represent the value of the fruit culture at the date of this estimate—1874.

In the same way, for the same reason, it is difficult to arrive at the number of varieties of each kind of American fruit; but it appears that, while the European countries produce the greatest varieties in pears, cherries, and strawberries, the United States bears the palm as regard apples, hardy grapes, and peaches.

FRY, JAMES B., b. Ill., 1827; a graduate of West Point, served in the Mexican war, and as instructor in the military academy. In 1861, he was chief of staff to gen. McDowell, sharing in the battle of Bull Run; the next year he was gen. Buell's chief of staff, participating in the battle of Shiloh and other engagements. He was provost-marshal-general, in which position he added 1,120,000 men to the union army, arrested 76,500 deserters, and made a general estimate which showed 2,254,000 men subject to conscription who were not called out. He was promoted to the rank of brevet maj.gen. in 1866, and served on the Pacific and in the south.

FRY, WILLIAM HENRY, 1815-64, b. Philadelphia; son of William Fry, proprietor of the *Philadelphia National Gazette*. At a very early age the boy exhibited great musical talent, and meeting, fortunately, with appreciation that secured him a sound musical education. His first orchestral compositions, in 1835, were at once recognized for their power. They consisted of four overtures, and were performed by the Philadelphia Philharmonic society, and obtained for their composer the honorary medal of the society. His first opera was *Leonora*. It was greatly liked and reproduced by the Italian company. He spent six years in Paris, corresponding, during his stay there, with various newspapers in his own country.

Upon his return to New York, he lectured upon the history and science of music, and composed two symphonies, *The Breaking Heart* and *A Day in the Country*, in illustration of his views.

He composed a *Stabat Mater*, with vocal as well as orchestral score. He was connected with his father's paper, the *Philadelphia Gazette*, and undertook the editorship of the *Ledger* in 1844. When he settled in New York, he joined the editorial staff of the *Tribune*, a position which he retained until his death.

FRYE, JAMES, 1709-76; b. Mass.; a revolutionary officer who served in the siege of Louisburg, took an active part in the battle of Bunker hill, and commanded the sixth brigade of the army investing Boston.

FRYKEN, small lakes in Sweden in three main bodies and connected by narrow channels, the whole forming an irregular river. They are situated in the Frykedal, n.w. of lake Wenner.

FUACAM ET FLAGELLUM (gallows and whip), in feudalism, the lowest of all servile tenures, in which the bondman was entirely at the lord's mercy both in limb and life.

FUCHS, JOHANN NEPOMUK VON, 1774-1856; a German mineralogist and chemist, studying in Freiberg, Berlin, and Paris. In 1807, he was professor of those sciences in the university of Landshut, and in 1823 conservator of the mineralogical collections at Munich, where he was made professor of mineralogy. He retired from public life in 1852, and was ennobled in 1854. He is known for his discovery, in 1823, of a process for making a soluble glass used for fixing fresco colors, according to the method called stereochrony.

FUCHS, or FUCHSICS, LEONHARD VON, 1501-66; a German physician, one of the fathers of scientific botany. In his tenth year he was sent to school at Heilbronn, whence, a twelvemonth later, he was removed to Erfurt. After a year and a half, he was admitted a student of the university of that town, which in 1521 conferred on him the degree of *baccalaureus*. During the next 18 months, he gave lessons in Latin and literature in his native town. He then repaired to the university of Anspach, where, in 1524, he was created a master of arts. About the same time, he espoused the doctrines of the reformation. Having in 1524 received the diploma as doctor of medicine, he practiced for two years in Munich. He became, in 1526, professor of medicine at Ingolstadt, and in 1528 physician to the margrave of Anspach. In Anspach he was the means of saving the lives of many during the epidemic locally known as the "English sweating-sickness." By the duke of Würtemberg he was, in 1535, appointed to the professorship of medicine at the university of Tübingen, a post held by him till his death. F. was an advocate of the Galenic school of medicine, and published several Latin translations of treatises by its founder and by Hippocrates, besides controversial tracts against the opinions of H. Thrivierius, G. Ryffius, C. Egenolphus, G. Rufinus, G. Puteanus, and S. Montius.

FUENTERRABIA, or FONTARABRA, an ancient t. and frontier fortress of Spain, in the province of Guipúzcoa and bishopric of Pamplona, 11 m. e.n.e. of San Sebastian, and 2 m. from Irun; pop. 772. It stands on the slope of a hill on the w. bank of the Bidassoa, and near the point where its estuary begins. Though now much decayed, it formerly possessed considerable strategic importance, and it has frequently been taken and retaken in the wars between France and Spain. The "dolorous rout" of Charlemagne, however, which has been associated by Milton with F., is generally understood to have taken place not here, but at Roncesvalles, which is nearly 40 m. distant. Unsuccessful attempts to seize F. were made by the French troops in 1476, and again in 1503. In a subsequent campaign (1521) these were more successful, but it was retaken in 1524. The prince of Conde sustained a severe repulse under its walls in 1638, and it was on this occasion that the town received from Philip IV. the rank of city. After a severe siege it surrendered to the duke of Berwick in the English war of 1719, and in 1794 it again fell into the hands of the French, who so dismantled it that it has never since been reckoned by the Spaniards among their fortified places. It was by the ford opposite F. that the duke of Wellington, on Oct. 8, 1813, by "one of the most daring exploits of military genius," successfully forced a passage into France in the face of an opposing army commanded by Soult. Severe fighting also took place here during the Carlist war in 1837.

FUERTEVENTURA, one of the Canary islands, s. of Lazarote, across the straits of Bacayna; 753 sq.m.; pop. 10,996. Cabras, on the e. coast, has a good harbor.

FUH CHOW. See Fu Chow Foo, *ante*.

FUH-HE, or FUH-HE-SHE (*ante*), usually set down as the first of the emperors of China; possibly a real, but more likely a mythical person. His era would be about 3,000 B.C. It was an ancient belief of Chinese writers that there had existed a period of 2,267,000 and odd years between the time when the powers of heaven and earth first united to produce man as the possessor of the soil of China, and the time of Confucius. This having been accepted as a fact, it became necessary for the early historians to invent long lines of dynastic rulers to fill up the gap between the creation and the period with which the book of historical documents commences. Accordingly, we find a series of ten epochs described as preceding the Chow dynasty. The events connected with most of these are purely fabulous, and it is not until we come down to the eighth period that we can trace any glimmer, however obscured, of history. This, we are told, commenced with the reign of Yew-chaou She (the "Nest-having"), who, if such a man ever existed, was probably one of the first of those who, as the immigrants increased and multiplied, was chosen to direct their counsels and to lead their armies. This chief induced them to settle within the bend of the Yellow river, the site of the modern province of Shan-se, and taught them to make huts of the boughs of trees. Under the next chief, Suy-jin She ("the Fire-producer"), the grand discovery of fire was effected by the accidental friction of two pieces of dry wood. He taught the people to look up to Teen, the great creating, preserving, and destroying power; he invented a method of registering time and events, by making certain knots on thongs or cords twisted out of the bark of trees. Next to him followed Yung-ching She, and then Fuh-he, who separated the people into classes or tribes, giving to each a particular name, discovered iron, appointed certain days to show their gratitude to heaven by offering the first fruits of the earth, and invented the eight diagrams which serve as the foundation of the Yih-king. Fuh-he

reigned 115 years, and his tomb is shown at Chin-choo, in the province of Shen-se, at this day. His successor, Chin-nung, invented the plow; and from that moment the civilization of China proceeded by rapid and progressive steps.

FUHRICH, JOSEPH VON, b. Bohemia, 1800; studied painting in Rome and other places, and was appointed professor of historical painting in the Vienna academy of fine arts. His best works are on scriptural subjects, and many churches possess his pictures.

FUIH SHAN, or FAT-SUAN, a city of China, in Quang-tong, 6 m. s.w. of Canton. In consequence of having a number of extensive iron-works it has been called the "Birmingham of China."

FUJI-YAMA, or FUSI-YAMA (*No-Awo-such* mountain, or "Rich Scholar" peak), an extinct volcano of peerless form, in the province of Suruga, Japan; the sacred mountain of the Japanese. According to tradition, Fuji was cast up by volcanic upheaval 285 B.C., when at the same time the earth sank, and lake Biwa in Omi province was formed. In 800 and 864 A.D., frightful eruptions took place which greatly increased the size of the mountain, and perfected its cone-like shape, whilst vast masses of rock were thrown out as far as the sea. In 1707, the eruption which formed the hump on the southern side took place. Other less fearful eruptions occurred in 936, 1031, 1083, and 1649. This dormant, but perhaps not extinct volcano, has a crater 500 ft. deep. An examination of several scientific measurements of its height gives an average of 12,000 feet. Five lakes lie at the base of F., which covers many square leagues of surface. The mountain is visible from 13 provinces, and from a great distance at sea. It is cultivated to the height of 2,000 ft.; then succeed plains of grass and forests, the lava cone having no vegetation. Immense numbers of pilgrims ascend the mountain yearly from May to November.

FULCO, or FOULQUES, OF NEUILLY, a famous pulpit orator of the 12th c., the foremost preacher of the fifth crusade. After a careless youthful life, he was converted by Peter the chanter, and suddenly became the most austere of ascetics. He commenced a series of journeys as a preacher, exhorting the people to repentance, and by the rigor of his ascetism enforcing his sermons. His clothing was of the coarsest description, and his eloquence was so great that, as he passed through the villages, the people prostrated themselves, confessing their sins and protesting their intention of leading new lives, and expiating the sins they had committed. Many followed his example, and began to teach and to preach. He died before the crusaders reached Palestine.

FULDA MANUSCRIPT, a complete and highly esteemed copy of the early Latin version of the New Testament, written in 546 by the command of Victor, bishop of Capua, and now among the treasures of the abbey of Fulda. In it an effort has been made towards an arrangement of the gospels in harmony with each other. It has been collated by Lachmann and Buttmann, and is to be printed.

FULDA, MONASTERY OF, was founded in 744 by Boniface, "the apostle" of Germany, who sent Sturm, one of his followers, to search for a suitable site secure from Saxon attack. This was discovered on the banks of the Fulda, in the depths of the forest, within what afterwards became the duchy of Hesse-Cassel. A grant of the spot, with 4 m. of surrounding territory, was obtained from Carloman, son of Charles Martel. Boniface superintended the clearing of the ground and the erection of the building, while Sturm spent a year in Italy, visiting the monasteries, and studying the mode of life pursued at the celebrated Benedictine convent of Monte Cassino. The Benedictine rule having been adopted, Sturm was made abbot, and, with seven helpers, began the work of preaching, instruction, and civilization. The rude tribes were taught agriculture, building, and other peaceful arts. A school was established on the model of those taught by Patrick and Columbo in the British isles. This soon became the most important work of the monastery, and a center of mediæval theological learning. Under Rabanus Maurus, the first of the schoolmen, there were 12 instructors who taught grammar, rhetoric, logic, the German language, and theology, together with a practical knowledge of mechanics and fine arts. Many princes, afterwards famous, were educated there. Alcuin, in his great work of founding and advancing universities in continental Europe, looked for help to Fulda as one of the acknowledged centers of learning. There also originated many other missionary monasteries, the most celebrated of which was Hirsgau, in the diocese of Speier. In 968, the abbot of Fulda was made primate of the abbeys of Germany. But with the advance in influence and wealth there was an increasing corruption in many of the monasteries; and from this Fulda did not escape. At the beginning of the 11th c., a reform was attempted by substituting new monks from Scotland for the old, and re-establishing in all its strictness the Benedictine rule. The reformation of the 16th c. seems to have been welcomed by many of the monks; but in 1573, the abbot thoroughly effected among them the suppression of evangelical doctrine.

FULFORD, FRANCIS, D.D., 1803-68; b. England, educated at Exeter college, and afterwards held positions of importance in the English church. In 1850, he was made lord bishop of Montreal and metropolitan of Canada. His publications are *Progress of the Reformation*, and several volumes of sermons.

FULGENTIUS, FABIVS CLAVDIIVS GORDIANVS, SAINT, b. Africa, 468 A.D. He was in Rome at the age of 32, and on his return to Africa founded a monastery and became distinguished for devotion and learning. He was made a bishop in 504, and was recognized as one of the ablest defenders of Christianity against Arianism and Pelagianism; explaining the system of Augustine with consistency, but avoiding the harsh points of the predestinarian view. Yet even he held that all unbaptized children, even those not yet born, are consigned to damnation. He was twice banished, but recalled, and passed his latter years in peace. The Roman Catholic church commemorates his death on the first day of the year.

FULGENTIUS, FABIVS PLANICADES. A writer whose life is little known. Several voluminous works are attributed to him, and amongst them one which later research has definitely proved to have proceeded from the pen of Fabius Claudius Fulgentius. The title of this book is *Liber Voluminum XIII. de Aetatibus Mundi et Hominis*, and is in as many volumes as there are letters of the alphabet. Of the 23 only 14 are extant, and were reissued by a Parisian publisher in 1696.

FULLER, ARTHUR BUCKMINSTER, 1822-62; b. Mass., graduated at Harvard, and studied theology in the Cambridge divinity school. He was a teacher and preacher in Illinois; and pastor in Boston and Watertown. He volunteered in the union army in the rebellion, and was made chaplain in a Massachusetts regiment. At Fredericksburg he was killed by a sharpshooter. He was a brother of Margaret Fuller (marchioness d' Ossoli), and edited her works.

FULLER, JOHN W., b. England, 1827; came to the United States in 1833, and established himself as a bookseller. He volunteered for the union in the war of the rebellion, and served with the Ohio troops with distinction, rising to the rank of brevet major. gen. in 1865.

FULLER, RICHARD, D.D., 1804-76; b. S. C. At twenty years of age he chose the law as a profession, but afterwards united with the Protestant Episcopal church, and later still entered the Baptist ministry. In 1847, he became pastor of the Seventh Baptist church in Baltimore, where he remained till his death. He has published *Letters on the Roman Chancery; Correspondence on Domestic Slavery; Baptism and Communion; Sermons;* etc. He held a high rank among American preachers for eloquence and spiritual power.

FULTON, a co. in n. Arkansas, on the Missouri border, intersected by Spring river; 658 sq.m.; pop. '70, 4,843-84 colored. Surface hilly, and covered to a great extent with forests. The soil is fertile, producing corn, cotton, etc. Co. seat, Salem.

FULTON, a co. in n.w. Georgia, on the Chattahoochee; 200 sq.m.; pop. '70, '33, 446-15,282 colored. It is intersected by five railroads which concentrate at Atlanta, the co. seat. Surface hilly; soil fertile, producing cotton, corn, etc.

FULTON, a co. in w. Illinois, bounded by the Illinois and intersected by Spoon river, and crossed by three important railroads; 870 sq.m.; pop. '70, 38,291. There are mines of bituminous coal, and plenty of hard timber. The surface is undulating and the soil fertile, producing corn, wheat, oats, hay, pork, cattle, etc. Co. seat, Lewis-town.

FULTON, a co. in n. Indiana on Tippecanoe river, crossed by the Indianapolis, Peru, and Chicago railroad; 66 sq.m.; pop. 12,796. It is level, largely covered with forests, and the soil is fertile. The chief productions are wheat, corn, hay, and pork. Co. seat, Rochester.

FULTON, a co. forming the s.w. corner of Kentucky on the Tennessee border and the Mississippi river, intersected by the Mobile and Ohio, and the Nashville, Chattanooga, and St. Louis railroads; 200 sq.m.; pop. '70, 6,161-937 colored. It is level, and the soil is fertile; chief productions, corn, cotton, tobacco, pork, etc. Co. seat, Hickman.

FULTON, a co. in e. central New York, bounded on the w. by East Canada creek, and connected with the New York Central railroad by the Fonda, Johnstown, and Gloversville road; 530 sq.m.; pop. '75, 30,155. The surface is hilly; soil mostly fertile, producing corn, oats, hay, butter, cheese, etc. There are many extensive manufactories, especially of gloves and mittens. Co. seat, Johnstown.

FULTON, a co. in n.w. Ohio, on the border of Michigan, drained by tributaries of Maumee river, and intersected by the Lake Shore and Michigan Southern railroad; 337 sq.m.; pop. '70, 17,789. It is undulating and abounds in forests. The soil is fertile; chief productions, wheat, corn, hay, etc. Co. seat, Wauseon.

FULTON, a co. in s. Pennsylvania on the Maryland border, drained by Licking creek and tributaries of the Potomac; 380 sq.m.; pop. '70, 9,360. It is a rough mountainous region, having Sideling hill on the w. and Tuscarora mountain on the east. The valleys are fertile, producing corn, oats, hay, etc. Co. seat, McConnellsburg.

FULTON, the seat of justice of Callaway co., Missouri, on the Chicago and Alton railroad, 26 m. n.e. of Jefferson City; pop. 1585. It is the seat of two state institu-

tions—one for the deaf and dumb, and one for the insane. The Westminster (Presbyterian) college is here, founded in 1852; and there is a female seminary. There are also some manufactures.

FULTON, a village in Fulton co., N. Y., on the New York and Oswego Midland, and the Syracuse and Oswego railroads, on the e. bank of the Oswego river, 24 m. n.w. of Syracuse; pop. 3,507. It contains manufactories of flour, woolen goods, machinery, etc.; a seminary, and a graded school, and issues two newspapers.

FULTON, JUSTIN D., D.D., b. New York, 1838; graduated at Rochester university and the theological seminary in the same city; ordained in 1854 to the Baptist ministry in St. Louis, where he was editor of the *Gospel Banner*. Since then he has had pastoral charges in Sandusky, O.; Albany and Boston, and since 1873 in Brooklyn, N. Y. Among his works are *Roman Catholic Element in American History*; *Woman as God Made Her*; *Rome in America*; *Radicalism*; *The Sabbath*; etc. He is an earnest denomination-alist, and has taken active interest in the temperance and woman's rights movements.

FULVIA, a Roman woman, lived about 80–40 B.C. She was the daughter of Fulvius Bambalio, and was married three times—her third husband being Marc Antony, for whose sake she abandoned a dissolute life. By him she had two sons. When he allowed himself to be detained in Egypt by Cleopatra, F. stirred up an insurrection to compel his return home; and to revenge herself at the same time upon Octavius, who had married and repudiated her daughter Clodia. The insurrection was quelled, and she fled to Greece, where Antony met her with many reproaches. She died of disappointment, and Antony married Octavia, sister of Augustus. It is recorded of F. that when the head of Cicero was brought to her she thrust a needle through the tongue.

FUMBINA. See ADAMAWA.

FUNCTUS OFFICIO, a phrase applied to something which, having formerly had vitality and force, is without any function to be discharged. When an agent or officer has fulfilled the duty assigned him, his office is *functus officio*. The same is true of legal papers which have been duly executed, and on which a judgment of court has been entered.

FUNDAMENTALS, IN CHRISTIAN DOCTRINE. I. Roman Catholic theologians give this name to those doctrines which, in their opinion, every Christian is obliged to know, believe, and profess, on pain of being lost; while non-fundamentals are such as a man may, involuntarily, be ignorant of, without forfeiting his Christian name and hope of salvation. Practically, according to the Roman view, whatever the church teaches is fundamental, and the terms of communion are the same as those of salvation. II. At the reformation, a similar distinction was introduced into the Lutheran church according to which the doctrines concerning Christ as the Mediator, and the word of God as the seed of truth, were placed among the truths necessary to salvation. III. All Christians consider certain truths as essential to the Christian system, and others as comparatively unessential. But here a distinction must be drawn between truths essential to Christianity as a system and the degree of knowledge concerning them essential to individual Christians in order that they may be saved. The former are as invariable as Christianity itself; the latter is as variable as the capacities and opportunities of men. In like manner the terms of communion may be very different from those of salvation. In Cromwell's time (1653) a committee of clergymen was appointed to draw up a catalogue of "fundamentals," to be reported to the parliament. Richard Baxter, who was one of the committee, proposed that the list should consist of the apostles' creed, the Lord's prayer and the ten commandments; but instead of these, 16 items were reported, including doctrines concerning God, Christ, divine worship, faith, sin, the resurrection, the judgment, everlasting life, and everlasting condemnation. On the whole, as concerns evangelical Protestant churches, it may be said that with many specific points of difference in the statement of fundamentals in doctrine, there is a general agreement, and that this agreement is increasingly recognized.

FÜNEN. See FÜHNEN, *ante*.

FURCA, a mountain in the canton of Valais, Switzerland, w. of St. Gothard; more than 8,000 ft. high.

FURETIÈRE, ANTOINE, 1620–88; best known as the author of a dictionary of the French language. He practiced for a time as an advocate, but finally entered the church and became abbe of Châlivoiv. In his leisure he devoted himself to letters, and in virtue of his satires—*Nouvelle Allégorique ou Histoire des deniers troubles arrivés au Voyageur d'éloquence*; *voyage de Mercure*, etc.—he was admitted a member of the French academy in 1662. That learned body had long promised the world a complete dictionary of the French tongue; and when they heard that F. was on the point of issuing a work of a similar nature, they interfered, alleging that he had purloined from their stores, and that they possessed the exclusive privilege of publishing such a book. After much bitter recrimination on both sides, the offender was expelled in 1685; but for this act of injustice, he took a severe revenge in his satire, *Couches de l'Académie*. The reply which he made to the academician Charpentier, entitled *Factums*, ran through four editions. His dictionary was published at Rotterdam two years

after his death. Revised and improved by Basnage, it was issued in 1701, and again in 1725; and continued to enjoy a high reputation till the appearance of *Dictionnaire de Trévoux*, for which, indeed, it furnished the basis. Furetière's other works do not possess any great literary merit; but one of them, *Le Roman Bourgeois*, is of interest as descriptive of the every-day life of his times.

FUR AND FURRIERY (*ante*). Trade in furs began with the first European settlements in North America, and beaver-skins were used in New Amsterdam and elsewhere in place of gold and silver for currency. The figure of a beaver is a conspicuous figure on the escutcheon of the city of New York. The search for furs was one of the objects of the daring expeditions of the voyagers of French Canada, as the search for gold was the motive power of Spanish invasion of Mexico and South America. The famous Hudson's bay company originated in 1670, and claimed the entire country from the bay to the Pacific and from the great lakes to the Arctic ocean, except such portions as were then occupied by Frenchmen and Russians. Towards the close of the 18th c., certain Canadian merchants formed the Northwest fur company, having their headquarters at Montreal, their operations being carried on in the districts watered by rivers that flow to the Pacific. This organization soon became a formidable competitor with the Hudson's bay company. In 1821, the two companies united. The charter expired some years ago, and the once powerful organization is now a simple trading-company. In 1763, some merchants of New Orleans established a fur-trading post where St. Louis now stands, under the management of the brothers Chouteau. For the first half of the present century the St. Louis trade was from \$200,000 to \$300,000 a year. One of the most famous of early American fur-traders was John Jacob Astor, of New York, who began by trading in a small way upon his arrival in the country in 1784. By 1810-12, his trade, conducted under the name of the American fur company, was enormous. An entirely new field for American enterprise was opened by the purchase of Alaska in 1867, which secured complete control of an important seal-fishery. This field was so eagerly worked that it was found necessary to limit the taking of seals to 100,000 per year, and those only to be males, lest the animals should be altogether exterminated. The annual value of the trade in Alaska alone is about \$1,250,000.

Collectors and dealers in Canada and the United States forward their furs to the seaboard, chiefly to New York, for sale there, or for consignment principally to London and Leipsic. In the latter town, spring and autumn fairs are still maintained, at which every kind of wares are sold or exchanged with dealers from Turkey, Austria, and Russia. Nijni-Novgorod is the chief fair for European Russia, though very important fairs are also held in Kasan and in Irbit, among the Ural mountains. The most important fair for eastern Siberia is held at Kiachta, on the borders of China, where an extensive exchange of furs is carried on with the Chinese. Japan has entered very little into the fur trade, though her northern shores have furnished many fine fur-seals and sea-otters to the hardy navigator. Staple furs, or those used chiefly in the manufacture of hats, are those of the hare and the rabbit, collected mainly in Russia, Germany, France, and England; dressed, caroted, and cut from the skin in western Germany, France, Belgium, and England; and thence distributed to the manufacturing centers of the world; and here it may be added that the clippings and cuttings of fancy furs from the workshops of furriers are all saved, and find their way to the machinery which utilizes the waste and transforms them into hatters' furs. But of all these fur marts, that of London is the chief, for thither tends, by the laws of trade, not only much of the produce of Asia and Europe, but also the fine peltries of Chili and Peru, the nutria from Buenos Ayres, the fur-seal of Cape Horn and South Shetland, the hair-seal from Newfoundland, as well as the inferior peltries of Africa. To prepare fur skins in a way to endure this long transportation is a simple and easy matter. When stripped from the animal the flesh and fat are carefully removed, and the pelts hung in a cool place to dry and harden; nothing is added to protect them. Care is taken that they do not heat after packing, and that they are occasionally beaten to destroy worms. A marked exception is the case of the fur-seal, which is best preserved by liberal salting and packing in hogsheds. All other raw furs are marketed in bales.

Few kinds of animals furnish a pelt of suitable weight and pliability, and all of them differ widely in elegance of texture, delicacy of shade, and fineness of overhair; and these differences determine their place in the catalogue of merchandise. These few animals are not very prolific, and many of them attain their greatest beauty in wild and uncultivated regions. To this remark there are some notable exceptions; being thus few in kind, and limited in quantity, the extinction of the several choice varieties might be expected through the persistent energy of the trapper. But here the fickleness of fashion steps in, and does for the fur trade what the law of supply and demand does for the more staple articles of commerce. Fashion, fastidious and fickle, neglects the use of certain kinds for a season; the market price of the pelt no longer repays the outfit of the trapper; the hunt is intermitted, and in two or three years the animal regains its numbers and strength. The annual collection of furs is thus subject to ceaseless change; but the following may be relied on as an estimate correct enough for all practical purposes. [The table and the principal facts here given, are from *Encyc. Brit.*, 9th ed.]

AVERAGE ANNUAL COLLECTION.

Badger.....	America.....	5,000
".....	Europe and Asia.....	50,000
Bear.....	America.....	15,000
".....	Europe and Asia.....	4,000
Beaver.....	Asia.....	20,000
".....	America.....	200,000
Buffalo.....	America.....	100,000
Chinchilla.....	Peru and Chili.....	100,000
Cat, Wild.....		10,000
" House.....		1,000,000
Ermine.....	Asia and Europe.....	400,000
Fisher.....	America.....	12,000
Fitch.....	Europe.....	600,000
Fox, Silver.....	Asia and America.....	2,000
" Cross.....	Asia and America.....	10,000
" Blue.....	Europe and America.....	7,000
" White.....	Arctic.....	75,000
" Red.....	Asia and Europe.....	300,000
".....	America.....	60,000
" Gray.....	America.....	30,000
" Kit.....	America.....	40,000
Hamster.....	Europe.....	200,000
Hare.....	Asia and Europe.....	4,500,000
Kolinsky.....	Asia.....	80,000
Lamb.....	Persian.....	100,000
".....	Astrakhan.....	600,000
".....	European.....	2,000,000
Lion.....		500
Lyme.....		50,000
Marten.....	America.....	130,000
" Stone.....	Europe.....	150,000
" Baum.....	Europe.....	60,000
" Russian Sable.....		100,000
Mink.....	America.....	250,000
".....	Russia.....	50,000
Monkey.....	Africa.....	40,000
Musk-rat.....	America.....	3,000,000
".....	Russia.....	100,000
Nutria.....	South America.....	3,000,000
Opossum.....	America.....	250,000
Otter, Land.....		40,000
" Sea.....	North Pacific.....	5,000
Rabbit.....	Europe.....	5,000,000
Raccoon.....	America.....	500,000
Seal, Hair.....	Atlantic.....	1,000,000
" Fur.....	Pacific.....	200,000
Skunk.....	America.....	350,000
Squirrel.....	Siberia.....	6,000,300
Tiger.....	Bengal and North China.....	500
Wolf.....		25,000
Wolverin.....		3,500

FÜRICH, JOSEPH VON, 1800-76; a painter and contemporary of Cornelius and Overbeck. His first attempt at composition was a sketch of the *Nativity* for the festival of Christmas in his father's house. He lived to see the day when, becoming celebrated as a composer of Scriptural episodes, his sacred subjects were transferred in numberless repetitions to the roadside churches of the Austrian state, where humble peasants thus learned to admire modern art, reviving the models of earlier ages. F. has been fairly described as a "Nazarene," a romantic religious artist whose pencil did more than any other to restore the old spirit of Dürer and give new shape to countless incidents of the Gospel and scriptural legends. He was a master of the art of arrangement, and in form, movement, and expression his power was considerable. His drapery, if peculiar, was perfectly cast. Endowed with creative genius, he lacked skill as a colorist. Among his well-known works are illustrations to the "Lord's Prayer," the "Triumph of Christ," the "Road to Bethlehem," the "Succession of Christ according to Thomas à Kempis," and the "Prodigal Son." The latter especially is remarkable for the constant recurrence of the allegorical spirit of evil. F. studied under Bengler in the academy of Prague in 1816. His earliest inspirations were derived from the prints of Dürer and the *Faust* of Cornelius. In 1834, he was made custos and in 1841 professor of composition in the academy at Vienna. In 1854-61, he produced the vast series of

wall paintings which cover the inside of the Lerchenfeld church at Vienna. In 1872, he was pensioned and made a knight of the order of Franz Joseph.

FURMAN, RICHARD, D.D., 1755-1825; b. N. Y.; removed when a child to South Carolina. At the age of 18, he became a Baptist minister, and was conspicuous for eloquence and patriotism during the revolution. Several of his discourses were published.

FURNACE, a contrivance for the production and utilization of heat, for warming, ventilating, cooking, and for manipulation of metals and liquids in the arts. Calcining furnaces are those in which the solid fuel is mixed with the matters to be heated. Crucible furnaces are used for melting steel or brass, and the F. itself is imbedded in the mass of heating fuel. Forge furnaces are such as are in ordinary use by blacksmiths, merely a combination of draft and blowing from a bellows. Blast and cupola furnaces are used in the smelting of iron and other ores, and the fusing of hard metals. In these the stuff to be melted and the fuel are charged in combination in the upper end of a vertical cylinder, and the combustion is produced by air forced in at the bottom. Flame furnaces are of varied form and character. Their effect is obtained by bringing a flame or current of highly heated gas into contact with the thing to be acted upon, instead of imbedding the substance with the fuel. The well-known reverberatory F., with fire-grate, flume-chamber, etc., is so arranged that by means of a low arched roof the flame is reverberated or turned back upon the material to be operated upon. Gas furnaces have recently come into use; there are five or six different kinds. There are furnaces for burning powdered fuel, for natural gas, and for petroleum. Furnaces are also very largely used in glass-making, and in metallurgy and iron-manufacture.

FURNAS, a co. in s. Nebraska, on the Kansas border, intersected by Republican river; 900 sq.m.; pop. 1550. The surface is undulating, with very little woodland. It is a grazing country. Co. seat, Beaver City.

FURNESS, WILLIAM HENRY, D.D., b. Boston, 1802; graduated at Harvard; studied theology at Cambridge, and was ordained pastor of the First Unitarian church in Philadelphia in 1825. A great part of his life has been devoted to the study of the life and spiritual ideas of the Savior, in pursuit of which he has published *Remarks on the Four Gospels*; *Jesus and His Biographers*; *History of Jesus*; *Thoughts on the Life and Character of Jesus of Nazareth*; *The Veil partly Lifted*, and *Jesus becoming Visible*. He has composed prayers, hymns, and other devotional works, and made translations of secular poetry from the German; besides contributing to current religious literature. He was also widely known in the long struggle with slavery as a supporter of the cause of freedom. His writings show an unusually refined spiritual sentiment.

FURNESS, WILLIAM HENRY, JR., 1828-67; b. Philadelphia, son of William Henry. He early turned his attention to art, and studied in various cities of Europe. He commenced his career as portrait-painter in Philadelphia, but soon afterwards removed to Boston, where he met with an exceptional success. Among his sitters were his father, Charles Sumner, Lucretia Mott, and many celebrities of the day. He was on the high-road to fame when he died at the age of 39.

FURNITURE (*ante*), the chattels and fittings required to adapt houses, churches, ships, etc. for use. The sculptures, paintings, and metal work of antiquity and of the later ages, now kept in museums and private collections, have, with few exceptions, formed part of decorations or furniture of temples, churches, or houses. Most of the ancient bronzes, are either images taken from ancient shrines, or pieces of mirrors, tripods, altar vessels, or even the dishes and pans of the kitchen. Wood, ivory, precious stones, bronze, silver, and gold have been used from the most ancient times in the construction, or for the decoration, of seats, chests, tables, and other furniture, and for the shrines and altars of sacred buildings. Most of the mediæval furniture, chests, seats, trays, etc., of Italian make, were richly gilt and painted. In northern Europe carved oak was more generally used. State seats in feudal halls were benches with ends carved in tracery, backs paneled or hung with cloths, and canopies projecting above. Bedsteads were square frames, the testers of paneled wood, resting on carved posts. The splendor of most feudal houses depended on pictorial tapestries which could be packed and carried from place to place in chests of carved oak or Italian cypress. Wardrobes were rooms fitted for the reception of dresses, as well as for spices and other valuable stores. Excellent carving in relief was executed on caskets which were of wood or of ivory, with painting and gilding, and decorated with delicate hinges and locks of metal work. The general subjects of sculpture were taken from legends of the saints or from metrical romances. Renaissance art made a great change in furniture, as in architecture. Cabinets and paneling took the outlines of palaces and temples, and curious internal fittings were arranged in cabinets, still following the details of architectural interiors. The elegance of form and perfection of detail, noticeable in the furniture of the 16th c., declined during the 17th all over Europe. The frame-work became bulky and heavy, and the details coarse. To this period belongs the name of André Charles Boule, who furnished the palace of Versailles. He invented or perfected a beautiful system of veneering with brass and tortoise-shell, or brass and ebony, occasionally using white metal besides. Examples of this *buhl* or *boule* are shown in the Apollo gallery of the Louvre at Paris. The

system of veneering or coating common wood with slices of rare and costly woods, fastened down with glue by screw-presses, came into general use in the 18th century. Marquetry is veneer of different woods, forming a mosaic of pictorial or ornamental designs. Looking-glasses in large sheets exported from Venice at the end of the 17th c. were engraved with figures on the backs. The light fantastic frames which came into fashion in France were called "rococo" (from *roquaille*, *coquaille*, rock and shell work). Carved and gilt furniture was made in Italy, where it was best designed, and all over Europe, till late in the 18th century. The "empire" style, a stiff affected classicism, prevailed in France during the reign of Napoleon. It is shown in the metal mounts of veneered mahogany furniture, and in the carvings of chair legs and backs.

A return has been made during recent years to mediæval designs. In England there is a revival of the fashions prevalent during the first fifty years of the last century. In France and America the elegant Louis XIV. style is very popular. Bedroom furniture is no longer as rich or costly as when it was the fashion to include state bed-chambers among suites of rooms thrown open for the entertainment of guests. Light-colored woods, with the simplest decorations, are preferred by many, on account of their freshness and cheerfulness. Common woods, such as pine, ash, oak, and maple, with French polish and with colored lines sparingly employed, are much in use for bedroom furniture, though less durable than mahogany. Imitations by graining are general, though not satisfactory; the practice was common even in ancient Rome. The Japanese have a method of staining, powdering with gold-dust, and polishing common wood without hiding the grain.

The designs of furniture in the United States vary greatly. Among the styles often seen are the Gothic, Florentine, Venetian, Roman, and Dutch, the classic and the *rococo*. The Eastlake style, now in favor, is by some critics disliked as exaggerated. Many manufacturers employ "furniture designers," frequently persons who have a high reputation for artistic work. Often the designs of the furniture are procured from the architect of the house, thus avoiding incongruities.

The census of 1870 reported 5,981 manufacturers of furniture, employing 53,298 persons; with a capital of \$43,947,913; paying \$21,574,531 as wages; using \$25,843,170 worth of raw material, and manufacturing furniture to the amount of \$69,082,684. [Principally from *Encyc. Brit.*, 9th ed.].

FUR-SEAL, a species of the family *otariida*, comprising eared seals, which have a thick under-coat of fine fur. They are eagerly hunted for their valuable skins. The Alaskan species is the *calorhinus ursinus*. See SEAL, *ante*.

FÜRSTENBERG, the name of two noble houses of Germany. The most important is in possession of a mediatised principality in the district of the Black Forest and the Upper Danube, which comprises the countship of Heiligenberg, the landgravates of Stühlingen and Baar, and the lordships of Jungnau, Trochtelfingen, Hausen, and Möskirch or Messkirch. The territory is discontinuous, partly in Baden, partly in Württemberg, and partly in the Prussian province of Sigmaringen. The head of the family is an hereditary member of the first chamber of Baden, and of the chamber of peers in Württemberg and in Prussia. The relations of the principality with Baden are defined by the treaty of May, 1825, and its relations with Württemberg by the royal declaration of 1839. The Stammort or ancestral seat of the family is Fürstenberg, in the Black Forest, about 13 m. n. of Schaffhausen, but the principal residence of the present representative of the main line is at Donaueschingen. The Fürstenbergs are descended from the counts Urachs, in the valley of the Ems, to the e. of Tübingen,—Henry I., the youngest son of Egon VI. of Urach, ranking as the founder of the family.

The second Fürstenberg family has its possessions in Westphalia and the country of the Rhine, and takes its name from the castle of Fürstenberg on the Ruhr, which is said to have been built by count Dietrich or Theodoric of Oldenberg in the 11th century. The two most remarkable men whom it has produced are Francis Frederick William, and Francis Egon. The former (1729-1811) became ultimately minister of the prince-bishop of Münster, and effected a great number of important reforms in the administration of the country; and the latter (1797-1859) was an enthusiastic patron of art, zealously advocating the completion of the Cologne cathedral, and erecting the beautiful church of Apollinaris, near Remagen, on the Rhine.

FU-SAN, a port in Corea, 35° 6' n., 129° 1' e., in the province of Kien-sang. For many centuries this place has been a Japanese port (or *kai*, whence also Fusankai). It is situated on a bay of the same name, containing an island called Tetsuye, on which many horses are reared. One league from Fu-san is the castle town of Sorio, and three leagues further is the large city of Torai (Corean, Tong Nai). During the year ending July, 1878, 24 steamers and 462 junks arrived at Fu-san, importing into Corea foreign goods amounting to \$341,818, and Japanese goods worth \$58,813; the Corean exports amounting to \$450,039.

FUSE, or FUZE (*ante*), for firing shells, torpedoes, blasts, etc. A time F. is regulated to burn for a given time and then communicate fire to the exploding charge. Another time F. is known as the Borneman, and is regulated to a quarter of a second. A percussion F. is ready for action on discharge, and takes effect after striking any solid object. Care is necessary in making them so that they may not be likely to explode in

handling or in ordinary transportation. The form used in the U.S. navy consists of a metal fuse stock inclosing a movable core-piece or plunger of steel bearing a musket-cap. When the shell strikes, the loose-fitting plunger continuing its motion explodes the cap and fires the charge. There are three or four kinds of percussion fuses. The concussion F. is put in action by the discharge, but the action is restrained until striking the object. Such fuses are made of high explosive fulminates, and are very dangerous to handle. For mining, electric fuses are used, called also exploders. They are of two classes: those in which the heat is obtained by the passage of the electric spark over a break in the circuit; and those in which the heat is obtained by the passage of the current over a conductor of great resistance. The first are tension fuses, and may be used with any static electric machine. There should be a very small break in the circuit, not greater than the spark can be made easily to pass over, and between the points of the break should be some substance that will be ignited by the passage of the spark. The second class embrace those in which, by the passage of the current, a portion of the circuit having a great resistance becomes sufficiently heated to ignite some explosive or inflammable substance in contact with it. Such fuses are used with the voltaic battery and the various dynamo-electric machines.

FUSEE, a spirally grooved cone in a watch or chronometer, with which the chain may be wound up on the pyramidal cone. This chain is attached to the box containing the spring, and the box rotates by the force of the uncoiling spring. The object of the peculiar form of the F. is, as the force of the spring is weakened by more and more uncoiling, to give a longer leverage at the other end of the chain (on the F.), and so to counteract the loss of power in the spring, thereby maintaining as nearly as possible a uniform rate of driving force.

FUSIBLE CALCULUS, a common form of stone, or urinary calculus. In the fusible form, the secretion is considerable, and is brittle, soft, smooth, and white. It contains ammonia-magnesian phosphate, calcium phosphate, and animal matter, and fuses readily before the blow-pipe.

FUSIYAMA. See **FUJI-YAMA**.

FUST, **JOHANN (FAUST, ante)**, d. 1466; generally considered one of the inventors of modern printing, Gutenberg being another. (See **GUTENBERG, ante**.) Fust was a rich and respectable member of a burgher family in Mainz, but not related to the patrician family of Fuss. The name was written Fust until, in 1506, Johann Schöffer, in dedicating the German translation of Livy, called his grandfather Faust. The family accepted the spelling and claimed Johann as one of their most distinguished ancestors. Fust appears to have been a money-lender, more renowned for prudence than for disinterestedness. His connection with Gutenberg, who is generally regarded as the real inventor of printing, has been variously represented, and during the present century F. has been pictured as a greedy speculator who took advantage of Gutenberg's necessity to rob him of the fruits of his invention. The first evidence of Gutenberg's obligations to F. would fix Aug. 22, 1449, as the day on which he borrowed 800 gold florins; but the Mazarin Bible (as it is now called) was completed years earlier. In the agreement mentioned, F. was to give Gutenberg 300 florins a year for expenses, wages, house-rent, parchment, paper, ink, etc. They were to divide the profits equally, and, if they wished to separate, Gutenberg was to return the 800 florins, and the materials were no longer to be security. F., as partner in the firm and holder of the mortgage, was to have half the profits. Gutenberg's great work was the Bible of Forty-two Lines, so called because there were 42 lines of print on each page, but now known as the Mazarin Bible, from the fact that a copy was found in the great cardinal's library. (There is a copy of this Bible in the Lenox library, New York city.) This work, a folio of 1282 pages, was finished in 1455. Various other works were issued by their press, when F., quite unexpectedly, it seems, and before the profits of the undertaking could be realized, brought a suit against Gutenberg to recover the money he had lent, claiming 2,026 florins for principal and interest. He had made a second loan in 1452 of 800 florins, but had not paid the 300 florins a year. The suit was decided in Fust's favor, Nov. 6, 1455. He took possession of the printing materials and went on with the work, having the aid of Peter Schöffer, to whom he gave his only daughter (Dyna) in marriage. F. is said to have gone to Paris in 1466, and to have died there of the plague. Until lately he has been confounded with the mythical magician, known as Dr. Johann Faust, no doubt a real personage, in spite of the many mystical traditions associated with his name. Even in the printing-houses of the present day these superstitions survive in the common title of "printer's devil," conferred upon the youngest apprentice—for Dr. Faust, the great magician, was credited with the invention of printing, and the art was popularly supposed to have been taught him by the devil; at least, that was the interpretation of the priests and other churchmen of the time. This wide-spread story of magic is worth tracing. Trithemius speaks in 1507 of magister Georgius Sabellicus, who called himself Faustus Junior. Conradus Metiamus Rufus (Conrad Mudt) in 1513, calls him "*quidam chiromanticus Georgius Faustus*." But Melancthon and the author of the oldest popular history of Faust, call the magician John, which name has been adopted in the popular books and generally accepted. This change of name, which has been variously explained, assisted in confusing the tradi-

tional remembrance of the printer, and led to its being worked into the Faust saga, perhaps the more readily as in his colophons Fust said that his books were not made with pen or pencil, "*sed arte quædam perpulchra*." The confusion has been much assisted by the history of Fust's supposed prosecution for magic, which, widely credited, and frequently repeated as an authentic anecdote, seems to have been first mentioned by Johann Walchius in 1610. He relates on the authority of Hendrik van Schore, or Schorus, a Flemish author, then an old man and provost of Surburg, that when Fust sold his Bibles in Paris, the purchasers, surprised to find all the copies agree exactly in every letter, complained of deception, and bringing back their books demanded their money, and pursued him even into Mainz, so that to escape he removed to Strasburg. John Conrad Durr, professor of theology at Altdorf, wrote an "*Epistola de Johanne Fausto*," dated July 18, 1676. Durr (after relating from Emmanuel van Meteren the tale of Koster's types being stolen on Christmas eve by John Fust, his workman, who fled to Amsterdam, then to Cologne, and lastly to Mainz), says that, on showing his books, F. was suspected of magic, as he could print in one day as much as several men could write in a year, and as the monks and nuns, who had long made great profits by copying, found their kitchens grow cold, and their bright fires extinguished, F. incurred their hatred and calumny, and was transformed into a magician; and this opinion was confirmed by his printing the *Doctrinale Alexandri*, a most popular mediæval Latin grammar, which gave rise to the story that Faust had caused Alexander the great to appear to Charles V. Lacaille repeats the account, with some additions. The whole story, as Bernard says, is so improbable as scarcely to deserve a serious refutation. There is no proof that the monks were hostile to printing, or that it interfered with the profits of the copyists. On the contrary, many books were printed by the monks; the early printers often set up their presses in monasteries, and Gutenberg, Fust, and Schöffer were on friendly terms with many conventual houses. Durr himself quotes from the *Chronicle of Aeginus* a statement that, if printing had not been discovered, the old books would have been lost, as the inmates of the monasteries would no longer write. Printing did the mechanical work, and multiplied the material for calligraphy and illumination, and therefore did not at first interfere with the profits of the scribes, or excite their hostility. The learned men who bought books in 1463 cannot have been ignorant of the invention of printing, which the colophon of the Bible of 1463 expressly mentions. No trace of a suit against F. has been found in the registers of the parliament of Paris. Shortly before his death, F. was known in Paris to Louis de Lavernade, a magistrate of the highest rank, who could have had no intercourse with a man accused of magic. The confusion is especially seen in the German puppet plays, even now placing Dr. Faust in Mainz, while the popular history makes him dwell in Wittenberg, the birthplace of Protestantism, where Marlowe's *Tragic History of Dr. Faustus*, founded on the prose history, places him. Many writers have accepted Durr's error; thus Charles calls Fust "*magicien à barbe blanche*," and Victor Hugo's introduction to Marlowe's play is based on this error, which, says Heine, "is widely spread among the people. They identify the two Fausts because they perceived indistinctly that the mode of thought represented by the magicians found its most formidable means of diffusion in the discovery of printing. This mode, however, is thought itself as opposed to the blind *credo* of the middle ages." [Mainly from *Encyc. Brit.*, 9th ed.]

FUTURE ESTATE, an estate of which possession is to commence at some future time. It includes remainders, reversions, and estates limited to commence in possession at a future day, without the intervention of a precedent estate to support them, which last are good in common law only in the case of a term of years. Such future estates are declared to be either vested, or contingent. They are vested when there is a person in being who would have an immediate right to the possession of the land upon the ceasing of the intermediate or precedent estate. They are contingent while the person to whom or the event upon which they are limited to take effect, remains uncertain.

FUTURE LIFE. See **IMMORTALITY**, *ante*.

FUX, JOHANN JOSEPH, 1661-1741; b. Styria; the composer of more than 400 works of various kinds and dimensions, but chiefly remembered as the author of a theoretical work on music. Of his youth and early training nothing is known. In 1696, he was the organist at one of the principal churches of Vienna, and in 1698 was appointed by the emperor Leopold I. as his "imperial court composer," with the considerable salary of \$30 a month. At the court of Leopold and his successors Joseph I. and Charles VI., F. remained for the rest of his life. To his various court dignities, that of organist of St. Stephen's cathedral was added in 1704. As a proof of the high favor in which he was held by the art-loving Charles VI., it is related that at the coronation of that emperor as king of Bohemia in 1723, an opera, *La Constanza e la Fortezza*, especially composed by F. for the occasion, was given at Prague. The performance took place in an open-air theater, and the *mise-en-scène* is said to have been of great splendor. Fux at the time was suffering from gout, but in order to enable him to be present at the performance, the emperor had him carried in a litter all the way from Vienna, and a seat in the imperial box was reserved for the composer. The numerous operas which F. wrote show no surpassing genius. Of greater importance are his sacred compositions, psalms, motets, oratorios, and masses. Among the latter, the celebrated *Missa Canonica* is an

amazing *tour de force* of learned musicianship, being written entirely in that most difficult contrapuntal device—the canon. Owing to his qualities as a contrapuntist and musical scholar generally, his great theoretical work, the *Gradus ad Parnassum*, has preserved its importance to the present day. For a long time it remained by far the most thorough treatment of counterpoint and its various developments. It was translated into most European languages during the 18th c., and is still studied by musicians interested in the history of their art.

FYROUZ I. (also called ARSACES XXIV., king of Parthia), one of the Arsacide kings of Persia, who reigned 83–103. The name is often spelled Feroze or Firouze, and means “victorious.”

FYROUZ II., 458–484, King of Persia, of the Sassanide dynasty. He overthrew and put to death his younger brother Hormuz, and so came to the throne. He was warred upon by the White Huns, who finally defeated him, and slew him and 29 of his sons. Historians differ widely as to his character and ability.

FYROUZ III., d. 679; the last Sassanide monarch. He was expelled from Persia by the new Mohammedan power, and took refuge with the emperor of China, who vainly endeavored to restore him to the Persian throne.

FYROUZE, or FEROZE, SHAH I., a Mohammedan king of Delhi, succeeding his brother in 1236 A.D., after having been governor of Lahore. He was deposed in the first year of his reign by his sister, the sultana Rezia.

FYROUZ SHAH III., 1269–1388; King of Delhi; successor of Mohammed III. in 1351. His reign was tranquil, and his country prosperous. He founded the city now called Ferozepoor, and commanded the construction of an important system of canals.

FYT, JOHANNES, 1609–61; b. Antwerp: the best painter of animals and game after Franz Snyder. F. entered the guild of St. Luke as a master, and from that time till his death, he produced a vast number of pictures in which the bold facility of Snyders is united to the powerful effects of Rembrandt, and harmonies of gorgeous tone are not less conspicuous than freedom of touch and a true semblance of nature. There never was such a master of technical processes as F. in the rendering of animal life in its most varied forms. He was not clever at figures, and he sometimes trusted for these to the co-operation of Cornelius Schut or Willeborts, whilst his architectural backgrounds were sometimes executed by Quellyn. “Silenus amongst Fruit and Flowers,” in the Harrach collection at Vienna; “Diana and her Nymphs with the Produce of the Chase,” in the Belvedere at Vienna, and “Dead Game and Fruit in front of a Triumphant Arch,” belonging to baron Anselm von Rothschild at Vienna, are specimens of the co-operation respectively of Schut, Willeborts, and Quellyn. They are also Fyt’s masterpieces. Great power is shown in the bear and boar hunts at Munich and Ravensworth castle. A splendid specimen is the “Page and the Parrot,” near a table covered with game, guarded by a dog staring at a monkey, in the collection of sir Richard Wallace. It is curious that Antwerp should possess only two examples of Fyt. The Madrid museum contains 11, the Lichtenstein gallery at Vienna 8, the Berlin, Vienna, and Dresden museums 5 each, the Louvre 3, and the London national gallery 1. With the needle and the brush Fyt was equally clever. He etched 16 plates, and those representing dogs are of their kind unique.

G

GABERLUN’ZIE, a term in Scotland for a beggar, originally applied to licensed beggars or king’s bedesmen, from the coarse woolen cloaks (*gabán*, cloak; and *lunzie*, linsey-woolsey) which they wore. They were also called “blue-gowns.”

GABII, a very old and once important city of Latium, 12 m. e. of Rome. Long before the foundation of Rome, Gabii appears to have been one of the largest of the Latin cities. It long maintained its independence; but after the time of Tarquin the proud, it appears in history as the ally or dependent of Rome. By gradual stages it fell into such a state of decay as to become a proverb of desolation. During the reign of Tiberius, its cold sulphurous springs attracted much attention, and it became a favorite fashionable resort. The emperor Hadrian patronized it, and supplied it with a town-house and an aqueduct. We hear little of G. after the 3d c., excepting in ecclesiastical history, where mention is frequently made of its bishops, up to the close of the 9th century. The principal relic of the ancient city is a ruined temple, probably dedicated to Juno, on a hill now crowned by the ruins of the mediæval fortress of Castiglione. Numerous and interesting statues and busts have been discovered. Quarries of an excellent building-stone, which was largely used by the Romans, existed in the neighborhood of Gabii. The Romans termed a peculiar method of girding the toga *cinctus Gabinus*. One end was thrown over the head, and the other fastened round the waist.

This fashion was adopted by the founders of a new town, or by the consul when he "declared war in the name of the Roman people, or devoted himself to death for his country."

GABLENZ, LUDWIG KARL WILHELM VON, 1814-74; an Austrian general, b. Saxony, educated in Dresden military academy. He entered the Austrian service in 1833. After the conclusion of peace he traveled extensively, and visited the interior of Africa. In 1848, he served in Italy under Radetsky as staff-major, and was promoted to a colonelcy. In 1853, he was director of the bureau of statistics in Vienna. In 1859, he distinguished himself at Solferino. In 1864, he commanded the 6th corps in the war against the Danes in Holstein, and was present at Sadowa. At the conclusion of the war he retired from the army, and was chosen a life member of the Austrian upper house, on the liberal side. He re-entered the service in 1867, and assumed command in Croatia, and in Hungary in 1869; finally retiring in 1871. Owing to the shock of financial losses, he put an end to his life by suicide.

GABRIEL, ST., ORDERS OF, in the Roman Catholic church, comprise two organizations: 1. A congregation of lay conventual brethren and non-conventual members at Bologna, devoted to the instruction of youth. 2. The brothers of St. Gabriel established in France in 1835, who also gave great attention to the spread of education in country places.

GABRIEL CHANNEL, in the Terra del Fuego islands, 54° 20' s., 70° 40' w., about 25 m. long, and from half a m. to 2 m. wide. In the center the banks rise abruptly to the height of 1500 feet. The channel is noted for the violent winds called by seamen "Williwaws."

GABRIELLI, CATARINA, 1730-96; b. Rome; the daughter of a cook in the employ of count Gabrielli, who, attracted by the child's fine voice, had her educated by Garcia. Her first appearance in opera took place in 1747, and she rapidly rose to eminence. In Parma, she became the mistress of Don Ferdinand, whose jealousy induced her to fly to Russia, where she was warmly received by the more profligate Catherine II. When the queen told her, in answer to her exorbitant demands, that she asked more money for a month's singing than a Russian field marshal received for a month's service in the field, she suggested that the queen might get her marshals to sing. She did not venture to appear in England, where she feared her strange manners might meet with rebuke. She sang for the last time in Milan, where her rivalry with Marchesi was so keen as to lead to popular disturbances. Her declining years were spent in retirement at Rome.

GAD'ARA, an ancient city of Syria, 8 m. s.e. of the sea of Galilee, on the banks of the Hieromax. The neighborhood Um Keis, formerly Gadara, is marked by extensive ruins, which support the statements of Josephus and Polybius, that G. was the capital of Perea, and one of the most strongly fortified places in the country. Traces of the walls can be found for a circuit of about 2 m.; one of the principal streets was bordered on both sides by colonnades; but perhaps the most noticeable of the ruins are two theaters. The cliffs around the town abound in tombs excavated in the limestone rock, and by a curious irony of fate these chambers of the dead are the only places where a living inhabitant of G. is to be found. According to Josephus, G. was a Greek city, and probably a foreign settlement. The name does not occur in the Scriptures; but in the New Testament, the phrase "the country of the Gadarenes" is used more than once, and there is no reason to doubt that it was in the vicinity of the town that the demoniacs were healed by the Savior. G. was captured by Antiochus in 218 B.C., and some twenty years afterwards, stood a ten months' siege by Alexander Jannæus. It was twice taken by Vespasian, in spite of the stout resistance offered by the Jewish inhabitants. At a later period, it became one of the most beautiful and flourishing cities of Syria; but after the Mohammedan conquest it fell once more into decay.

GADDI, AGNOLO, son of Taddeo, 1342-96. He was a painter and mosaicist, trained by his father, and, in middle age, a merchant in Venice, where he gained riches. His early paintings show much promise, hardly fulfilled in later years. One of the earliest, at St. Jacopo tra' Fossi, Florence, represents the resurrection of Lazarus. Another probably youthful performance is a series of frescos in the Pieve di Prato—legends of the Virgin and of her sacred girdle; the marriage of Mary is one of the best. In St. Croce, he painted, in eight frescos, the legend of the cross, beginning with Michael the archangel, giving Seth a branch from the tree of knowledge, and ending with the emperor Heraclius carrying the cross as he enters Jerusalem; in this picture is a portrait of the painter himself. Agnolo excelled Taddeo in composition of subjects, and in dignity and individuality of figures, and was a clear and bold colorist; the general effect is laudably decorative, but the drawing is poor, and his works require a distant view.

GADDI, GADDO, 1239-1312; a Florentine painter and worker in mosaics, said to have executed the great mosaic inside the portal of the cathedral of Florence representing the coronation of the Virgin; and more certainly credited with the mosaics inside the portico of the basilica of St. Maria Maggiore, Rome, relating to the legend of the foundation of that church, probably of the date of 1308. In the original cathedral of St. Peter in Rome, he also executed the mosaic of the choir, and those of the front, representing on a colossal scale God the Father, with many other figures; together with

an altar-piece in the church of St. Maria Novella, Florence. These works no longer exist. Some other extant mosaics are attributed to him, but without authentication. This artist laid the foundation of a very large fortune, whose increase placed his progeny in a distinguished worldly position.

GADDI, TADDEO, 1300-66; son of Gaddo; a Florentine artist, became one of Giotto's assistants. He was a painter, mosaist, and architect. He executed in fresco for the Baroncelli chapel, in the Florentine church of St. Croce, "The Virgin and Child between Four Prophets," on the funeral monument at the entrance; and on the walls various incidents in the legends of the Virgin, from the expulsion of Joachim from the temple to the nativity of Christ. His "Presentation of the Virgin in the Temple" contains the two heads which have been traditionally accepted as portraits of Gaddo Gaddi and Andrea Tafi. On the ceiling of the same chapel are "The Eight Virtues." In the museum of Berlin is an altar-piece by Taddeo; "The Virgin and Child;" and some other subjects, dated 1331; in the Naples gallery, a triptych, dated 1336, of "The Virgin enthroned with Four Saints," "The Baptism of Jesus," and his "Deposition from the Cross;" in the sacristy of St. Pietro a Megognano, near Poggibonsi, an altar-piece dated 1355, "The Virgin and Child enthroned among Angels." A series of paintings, partly from the life of St. Francis, are now divided between the Florentine academy and the Berlin museum; the compositions are taken from or founded on Giotto, to whom, indeed, the Berlin authorities have ascribed their examples. His figures are vehement in action, long and slender in form; his execution is rapid and somewhat conventional. To Taddeo are generally ascribed the celebrated frescos on the ceiling and western wall in the "*Cappella degli Spagnuoli*," in the church of St. Maria Novella, Florence. Three pictures in the London national gallery are doubtfully ascribed to him. As a mosaist, he left some works in the baptistery of Florence. As an architect, he supplied in 1336 the plans for the present Ponte Vecchio, and those for the original (not the present) Ponte St. Trinita; in 1337, he was engaged on the church of Orsan-Michele; and he carried on after Giotto's death the work of the unrivaled Campanile.

GADE, NIELS WILHELM, b. Denmark, 1814; an eminent composer. In 1841, he took the prize offered by the Copenhagen musical association, by his first great composition, *Nachklänge von Ossian*. Supported by the king, he proceeded in 1843 to Leipzig, to complete his musical education; and the next year he undertook, in the absence of Mendelssohn, the direction of the Gewandhaus concerts. In 1850, he settled in Copenhagen, where he became organist, director of music, and master of the chapel royal. He was elected one of the foreign members of the Berlin academy of arts in 1874; and in 1876, the Danish folkething voted life pensions of 3,000 crowns to the two most eminent musical composers, and selected G. as one. In addition to his prize compositions, he has written five symphonies, a quintette and an octette, and several vocal pieces with orchestra, among them the well-known *Erl King's Daughter*; the *Springtide Fantasy*; and many smaller compositions.

GADSDEN, a co. in n. Florida, on the Georgia border, on the Appalachian and Ocklocknee rivers, crossed by the Jacksonville, Pensacola, and Mobile railroads; about 490 sq. m.; pop. '70, 9,802—6,038 colored. The surface is uneven, and the soil fertile. Cotton and corn are the chief productions. Co. seat, Quincy.

GADSDEN, CHRISTOPHER, 1724-1805; b. Ga.; an early and strenuous advocate of the independence of the colonies. He was a member of the body which met in New York in 1765 to oppose the stamp act, and in 1774 was in the first continental congress, where he urged an attack upon the British troops in Boston. He was a brig. gen.: was engaged in the siege of Charleston; and was one of the makers of the constitution of South Carolina. As lieut. gov., he signed the capitulation when Charleston was captured by sir Henry Clinton. He and 77 others were immediately arrested, in violation of the terms of surrender, and Gadsden, refusing all terms of parole, was kept prisoner in the castle of St. Augustine for nearly a year. After peace, he was in the state legislature, where he opposed the confiscation of the property of loyalists. He was chosen governor in 1782, but declined to serve.

GADSDEN, CHRISTOPHER EDWARDS, D.D., 1785-1852; b. S. C.; graduated at Yale, and rose through various offices in the Protestant Episcopal church to be bishop of South Carolina, 1840. He was the editor of the *Gospel Messenger*. He was a noble Christian philanthropist, and at all times a devoted friend of the colored race.

GADSDEN PURCHASE, a strip of land embracing 45,535 sq. m. (about the area of Pennsylvania), extending from the Rio Grande del Norte near El Paso westward about 500 m., to the Colorado and the border of Lower California (Mexico); and from the Gila river, which is the n. boundary, to the lines fixed by the treaty of Dec. 30, 1853; the greatest breadth is about 120 miles. Nearly a third of the "purchase" is in New Mexico, and the remainder in Arizona. The transfer to the United States was negotiated with Santa Anna by gen. James Gadsden (1788-1858), a native of South Carolina, who had become prominently known during the second war with England and the Florida Indian war, and who was U. S. minister to Mexico when the purchase was made. The consideration was to be the payment by the United States of \$10,000,000, and the relinquishment by Mexico of from \$15,000,000 to \$30,000,000 of claims for Indian depreda-

tions. The transfer was so unpopular in Mexico that it hastened Santa Anna's banishment.

GAGARIN, an important princely family of Russia, of which some of the principal members were: MATTEI PETROVITCH, governor of Siberia, who suffered death in 1721 by order of Peter the great on suspicion of aspiring to an independent sovereignty; ALEXANDER IVANOVITCH, distinguished in the Crimean war, assassinated by the prince of Suatchi, whose province he was trying to annex to Russia; PAVEL PAVLOVITCH, a member of the council of emancipation, and, 1864-69, president of the council of ministers; IVAN, a Jesuit missionary and author of many ecclesiastical books and pamphlets, secretary to the Russian embassy in Paris, who founded in Constantinople the society of St. Dionysius the Areopagite with the object of reuniting the Greek and Latin churches.

GAGE, a co. in n.e. Nebraska, on the Kansas border, intersected by Big Blue river, and traversed by the Omaha and Southwestern railroad; about 900 sq.m.; pop. '70, 3,359-'76, 6,021. The surface is undulating and the soil is well adapted to cattle raising. Wheat, corn, oats, and hay are the leading products. Co. seat, Beatrice.

GAGE, FRANCIS DANA, b. Ohio, 1808; daughter of Joseph Barker and wife of J. L. Gage. She distinguished herself by lecturing in advocacy of total abstinence and of woman's rights, and was a strong opponent of slavery. She removed to St. Louis in 1853 and suffered the usual persecutions bestowed upon all prominent abolitionists. Returning to Ohio, she occupied the position of editor. During the war of the rebellion, she gave her services in caring for the sick and wounded of the union army. She is widely known as the writer of pieces for the young under the signature of "Aunt Fanny."

GAIL, JEAN BAPTISTE, 1755-1829; b. Paris; eminent as a Greek scholar, and in 1802 professor of Greek literature in the college of France. He published many works on Greek language and literature.

GAIL HAMILTON. See DODGE, MARY ABIGAIL.

GAILLARD, EDWIN SAMUEL, LL.D.; b. S. C., 1827; educated in the state medical college, traveled in Europe, and settled in New York city, where he gained a prize for an essay on ozone. In the war of the rebellion, he became medical director of the confederate armies. In 1867, he occupied a professor's chair in the medical college of Virginia. Removing to Kentucky, he became professor of the principles and practice of medicine in the Louisville medical college. He has edited the *Richmond and Louisville Medical Journal*, and the *American Medical Weekly*. He lost his right hand in the battle of Seven Pines.

GAINES, EDMUND PENDLETON, 1777-1849; b. Va. He served as lieut. in the regular army, and was concerned, while on frontier duty, in the arrest of Aaron Burr. In 1811, he resigned, but when the war with England began he returned to the service, and was in command at fort Erie when the British assault under gen. Drummond was repulsed. Upon this occasion he was wounded, congress presented thanks and a gold medal, and the president made him brevet brig.gen. He was engaged in the Indian wars in Georgia.

GAINES, MYRA CLARK; b. New Orleans, 1805; daughter of Daniel Clark, and widow of gen. Edmund P. Gaines. Her father came from Ireland to New Orleans in 1799, and inherited the property of an uncle. He was U. S. consul while Louisiana was still under French rule. After its transfer to the United States he became its representative in congress. In 1813, he died, leaving a vast property to his mother, Mary Clark. After his decease, it was ascertained that, although he had always declared himself a bachelor, he had privately married a beautiful French woman, the reputed wife of a man then absent in Europe, and by her had two daughters. The youngest, Myra, was adopted by a col. Davis, and took his name, in ignorance of her real paternity. She was principally educated in Philadelphia. In 1832, she married W. W. Whitney, of New York, who had become acquainted with the facts of her birth. Later on, it was further discovered that Clark, a short time before his death, had made a will, bequeathing his estate to Myra, and acknowledging her as his legitimate child. The history of the case is one of the most extraordinary and interesting in American jurisprudence. The result in, general terms, was, first, that the will, though never found, was sustained (1856) in the courts after an enormously expensive contest, in which, through many years, Myra showed dauntless purpose and indefatigable energy; secondly, that her legitimacy was established in the state and United States courts; thirdly, that by decision in equity in the U. S. supreme court (1867) she recovered possession of property in and near New Orleans estimated at \$35,000,000. She has been for several years engaged in the tedious process of ejecting those who have long had possession of portions of the estate. A large part of it has now come into her hands. After the death of her first husband, she married gen. Gaines in 1839.

GAINES'S MILL, the name given to a battle fought June 27, 1862, on nearly the same ground as the battle of Cold Harbor two years later. Towards the end of June, 1862, Lee, who had succeeded to the command of the main confederate army, had col-

lected about 100,000 men in and near Richmond. The union forces at the Chickahominy, under McClellan, numbered "present for duty" 115,102. The bulk of this army had been transferred to the right bank (s. side) of the river, and there intrenched, Porter with 27,000 men remaining on the n. side. For many days McClellan had been calling for and receiving reinforcements. After establishing himself on the s. side of the river he sent word, "The affair is over, and we have gained our point fully." An hour later he reported that Beauregard had reached Richmond with a strong force, that Jackson's advance corps was at Hanover court-house, that the confederate forces amounted to 200,000, and there was every probability that they would attack the next morning (June 26). The facts in reality being that Jackson's whole force had reached Hanover court-house, but Beauregard had not been near Richmond, being still in Alabama. At this time the north was awaiting the capture of Richmond, and it was to McClellan that they looked for it. His preparations had been lengthy, but the expected attack was still delayed until Lee anticipated him by striking first (at Mechanicsville) on the afternoon of the 26th. The same night McClellan determined to transfer his operations to the James river. He relinquished his intended attack on Richmond, and organized a retreat. In the course of the night the greater part of the heavy artillery was transferred to the right bank, but fearing that the sudden withdrawal of Porter's force to the same side would expose it to danger in the rear, and hoping to gain time, McClellan decided to resist Jackson with Porter's corps in a new position.

The position selected by him was a circular area from which he could completely command the approaches to the bridge. The left of the line, commanded by Morell, was established in a portion of the woods which lined the left bank of the Gaines's Mill stream, while its flank extended in the direction of the Chickahominy, the river at the time being completely swept by the artillery of the opposing forces. Sykes, who commanded the right of the line, had drawn up his men partly under cover of the woods and partly in the open. The second line comprised McCall's division. To the rear, under cover of a hill, gen. P. St. George Cooke, in command of the cavalry, kept guard over the left flank, and commanded the approach by the river. The confederates soon discovered the change of tactics, and started in hot pursuit, and towards noon a slight encounter took place at Gaines's Mill. At 2 P.M., the division under A. P. Hill, which had been delayed while waiting for Johnson, commenced the attack near Cold Harbor; but Sykes's division repulsed them with heavy loss. Lee, seeing the disadvantage of Sykes's position, and anxious to relieve him, ordered a feint on the union left, but Longstreet, the officer to whom he intrusted it, considered an attack in force desirable. The arrival of Jackson on the union right made a general engagement inevitable.

By 3 o'clock, it was necessary to bring up reserves, against the repeated attacks upon the union front. Porter dispatched orders for reinforcements, which, however, did not reach him until 3.30, when Slocum's division reached the scene of action, bringing up the efficient numbers to 35,000, opposed to a force numbering double that amount.

By 5 P.M., Porter reported himself as so little able to maintain his position that two divisions were told off to his assistance.

On the right, meanwhile, Sykes's division, already reinforced by Bartlett's brigade, held its ground well for some time, but at last the force brought against it was so overwhelming, that the lines were completely broken.

Porter now had recourse to his artillery, and had nearly accomplished a successful withdrawal of his remaining force, when gen. Cooke attacked the confederate force on the left. A withering fire replied; the horses, completely unmanageable, wheeled round, and dashed up the incline, thus throwing the gunners into the greatest confusion, as they imagined that the attack came from the enemy, and, losing their presence of mind, hastily withdrew their batteries.

The confederates now charged with great energy and fire, and, carrying all before them, captured 14 guns, and drove the union left back on the Chickahominy. The most important point of the line thus carried by assault, the right was forced to retreat, adding still more to the panic and confusion. Things were thus critical when the fortunes of the field wavered once more, as reinforcements under French and Meagher reached the ground and made their way impulsively to the front, while the retreating forces, once more encouraged, advanced in readiness for another attack. But the gathering darkness prevented Lee from following up his advantage. During the night, the union forces crossed the river, destroying the bridge behind them at 6 on the morning of the 20th.

McClellan, meanwhile, had remained with his forces on the s. side of the river, opposed to Magruder, who, in charge of only 25,000 confederates, had contrived, by simulated noise and excitement, to convey the impression that their number was much larger, thus inducing the union commander to remain inactive in expectation of an attack, which Magruder of course was equally anxious to avoid. Thus it came about that while Porter, with only 35,000, was striving against double his numbers, 25,000 men on the s. side of the river held a body of men at least twice as strong as themselves in check.

In this engagement the unionists lost 6,000 men and 22 guns, while the confederate loss amounted to 9,000.

GAIRDNER, WILLIAM, 1793-1867; b. Scotland; educated in Edinburgh, and graduated as a physician in 1813. After some years on the continent he settled in London and commenced practice. His observations upon the medical uses of iodine excited a good deal of attention, and he published a pamphlet on the subject. He is considered a great authority on gout, and wrote *Gout, its History, Cause, and Cure*.

GAISSIN, GAICYN, or HAICIN, a t. in Russia, 178 m. e. of Kamenetz Podolski; pop. '78, 9,417. With few exceptions, the houses are built of wood, and the inhabitants are mainly supported by agriculture. Among the public buildings are an orthodox church, a synagogue and four Jewish chapels, and a town hospital. G. dates from about 1690; it obtained Magdeburg rights in 1744 or 1745; and in 1796, after the incorporation of Podolia with Russia, it was made a district town.

GALABAT, GALLABAT, or METEMME, a t. in the frontier district of Egypt and Abyssinia near one of the western sub-tributaries of the Atbara, about 100 m. w. of Gondar; pop. of town and district (area about 40 sq. m.) estimated at 20,000. Most of the houses are built in the Abyssinian style, with conical roofs of grass, and the place would be of little importance if it were not the staple market for the exportation of Abyssinian produce across the Egyptian frontier. The people are industrious; and beeswax, coffee, cotton, and hides are the principal articles of legitimate trade; but as recently as 1873, the traffic in slaves was quite as important a department of its commerce. The town and district form a small ethnographical island, peopled by a colony of Tokrooris from Darfur, who, finding the spot a convenient resting-place for their fellow-pilgrims on their way to Mecca and back, obtained permission from the king of Abyssinia to make a permanent settlement. When sir Samuel Baker was at G. in 1862, the sheikh refused to recognize the authority of the viceroy of Egypt; but in 1873, when De Cosson passed through it, the Egyptians had established a camp, surrounded by a strong stone wall, on a hill commanding the town, and acted as masters of the place.

GALATEA. See ACIS.

GALATIANS, EPISTLE TO THE (*ante*), was universally received in the early church as a genuine work of the apostle Paul, and is clearly shown to be such by its contents, style, and manner. In the introduction (i. 1-5) Paul announces to the Galatians his apostolic authority as derived directly from the Lord, and salutes them in the name of the Father and of Christ. In the body of the epistle there is, I. A discussion of the subject which had occasioned it: 1. Paul vindicates his apostolic authority and teaching, by showing that he was sent out neither by the church at Jerusalem, nor by the apostles there, but directly by Christ, who had personally revealed himself to him. Consequently he was fully equal to any of the apostles (i. 6-ii. 21). 2. He shows that justification is by faith in Christ and not by works of the law; that the design for which the law had been given was to convince of sin as well as to restrain from transgression; that it was temporary, while preparatory to the gospel by showing the necessity of a perfect righteousness which only Christ could give. Such being the design of the law, Christians now are freed from it, as a son, on attaining his majority, is freed from tutors and governors (iii.-iv. 7). 3. He condemns the weakness and folly of the Galatians in taking on themselves the yoke of the law which they had never known, and thereby forfeiting the blessings of the gospel which they had so recently obtained (iv. 9-v. 9). II. Practical instructions and exhortations: 1. Instructions concerning the right of Christian liberty; the fulfilling of the law by mutual love; the various works of the flesh; the manifold fruits of the spirit (v. 13-26). 2. Exhortations, to win back the erring; to cherish mutual sympathy and render mutual help; to guard against self-deception; to persevere in well-doing; to do good to all—especially to Christians—in proportion to ability and opportunity. In conclusion, the apostle repeats his confidence in the cross of Christ as the only ground of justification, renews the declaration that according to the teaching of true Christianity outward observances are of no avail without purification of heart and life, and commends the church to the grace of Christ.

GALENA, a city in Illinois, the seat of justice of Jo Daviess co., a port of delivery, in the center of the lead-mining district, situated on the Fevre river 6 m. above its junction with the Mississippi; at the terminus of the Galena and Southwestern railroad, and on the northern division of the Illinois Central; pop. '80, 7,019. Steam-boats come up to the city, which is built on both sides of the river. The city has a custom-house, a German-and-English normal, and other schools; foundries, machine shops, flouring mills, and many other manufactories. The mining and trade in lead is, however, the chief business.

GALEOPITHECUS. See FLYING LEMUR, *ante*.

GALES, JOSEPH, 1760-1841; b. England. He was a bookseller and the publisher of the *Sheffield Register*. His liberal principles brought him into difficulty with the government, and he sold the paper to the poet James Montgomery, and coming to Philadelphia edited the *Independent Gazette*, and was the first to report debates in congress by short-hand. In 1799, he went to Raleigh, N. C., and established the *Register*, which he edited for nearly 40 years.

GALES, JOSEPH, 1786-1860; b. England; son of Joseph. He came to America with his father, and was educated in the university of North Carolina. He learned the art of printing in Philadelphia, and in 1807 settled in Washington as a partner in the *National Intelligencer*, of which journal he became sole proprietor in 1810. Two years afterwards he took William W. Seaton, his brother-in-law, into partnership, and in 1813 began the daily issue of the paper, which continued until 1869.

GALESBURG (*ante*), a city in Knox co., Ill., on the Chicago, Burlington and Quincy line, at the junction of the Peoria railroad, 164 m. w.s.w. of Chicago; pop. '70, 10,158. Situated in the midst of a rich farming region, it has considerable trade; also iron-foundries, and other important manufactories. The principal educational institutions are the Lombard (Universalist) university, founded in 1857, and Knox (Congregational) college, organized in 1841. Both institutions admit women. There are more than 15 churches, a city library, and a young men's association.

GALE'S COMPOUND, powdered glass with gunpowder, rendering the latter non-explosive; so named after the patentee.

GALILEE, SEA OF. See GENNESARET, *ante*.

GALLION, a city in Crawford co., Ohio, on the Atlantic and Great Western railroad, at the junction of two other lines; 58 m. n.e. of Columbus; pop. about 6,000. It has railroad shops, a foundry, and other manufactures, schools, churches, banks, etc.

GALLAGHER, WILLIAM D., b. Philadelphia, 1808. In 1816, he went to Cincinnati to work on a newspaper in the capacity of printer, writing occasional articles. He was successively editor of *The Backwoodsman*, the *Cincinnati Mirror*, the *Western Literary and Monthly Review*, and the *Hesperian*, and assistant editor of the *Cincinnati Gazette*. He has published several volumes of poems, and *Selections from the Poetical Literature of the West*; also works on agriculture. In 1853, he was one of the editors of the *Louisville Courier*. During the war of the rebellion, he was in the employ of the treasury department.

GALLAIT, LOUIS, b. 1810; a Belgian historical painter who studied at Antwerp and Paris, first exhibited at Brussels, and produced, in 1833, his picture of "Tasso in his Cell visited by Montaigne," which established his reputation. His pictures, which are generally on a large scale, represent subjects from the history of the Low Countries. "The Last Moments of Egmont," painted in 1853, "The Abdication of Charles V.," and "The Last Honors paid to Egmont and Horn," were among the chief attractions in the foreign gallery of the international exhibition of 1862. This artist, who resided at Brussels, was entertained in July, 1862, at a public dinner given to him by the amateurs and artists of Great Britain. He is a member of the academy royal of Belgium; obtained a medal in France in 1835, and the decoration in June, 1841; and was elected foreign associate of the Paris academy of fine arts, filling the position rendered vacant by the death of the German painter Overbeck.

GALLAS, MATTHIAS VON, Count, 1589-1647; a German soldier distinguished in the thirty years' war; became maj-gen in 1626. In 1629, he was associated with Altrugger in the capture and pillage of the city of Mantua, and G. was created field-marshal and ennobled. He succeeded Wallenstein as commander-in-chief, 1645, and after the assassination of Wallenstein, he commanded with Piccolomini in the battle of Nordlingen.

GALLATIN, a co. in s.e. Illinois, on the Wabash and Ohio rivers, traversed by the Ohio and Mississippi, and the St. Louis and South-eastern railroads; 350 sq.m.; pop. '70, 11,134. It is nearly level, and for the most part covered with forests. Corn, wheat, and pork are the staple products. Co. seat, Shawneetown.

GALLATIN, a co. in n. Kentucky, on the Ohio river, intersected by the Louisville, Cincinnati and Lexington railroad; 150 sq.m.; pop. '70, 5,074-600 colored. The surface is hilly, with fertile soil, producing corn, wheat, pork, etc. Co. seat, Warsaw.

GALLATIN, a co. in s. Montana, on the border of Wyoming, intersected by the Yellowstone river and the Gallatin Fork of the Missouri; 6,800 sq.m.; pop. '70, 1578. It is mountainous, with fertile soil in the valleys. Agriculture is flourishing, but timber is not plentiful. Gold and coal are among the minerals. Co. seat, Bozeman.

GALLATIN, MOUNT, in the national park in n.w. Wyoming, about 10,000 ft. high. Along its base runs the Gallatin river, and a branch of Madison river.

GALLAUDET, EDWARD MINER, LL.D., b. Conn., 1837; son of Thomas Hopkins. He has interested himself greatly in promoting the instruction of the deaf and dumb, and in 1864 took measures to establish the national deaf-mute college in Washington, of which he afterwards became president. He has written several books upon the education of the deaf and dumb.

GALLAUDET, THOMAS, D.D., b. Conn., 1822; son of Thomas Hopkins; graduated from Yale college in 1842, and was for 15 years professor in the New York institution for the deaf and dumb. In 1850, he became rector of a Protestant Episcopal church in New York, and established in it a service in the sign language. He has been manager of the church mission to deaf mutes, pastor of the sisterhood of the Good Shepherd,

and chaplain of the midnight mission, and has written and labored much in the cause of the education of deaf mutes.

GALLAUDET, THOMAS HOPKINS, LL.D., 1787-1851; founder of the first institution in America for the education of the deaf and dumb. He was educated at Yale, studied theology at Andover, and was licensed to preach in 1814. His after life was devoted to the instruction of deaf mutes, until 1838, when he became chaplain to the Connecticut retreat for the insane, where he remained until his death. Among his publications are *Discourses; Bible Studies for the Young*; etc.

GALLE, JOHANN GOTTFRIED, b. 1812; a German astronomer, educated at Wittemberg; teacher and assistant observer in the Berlin observatory while Encke was director. Having discovered three new comets, he received the prize of the French academy. He was asked by Le Verrier to assist in the search for the planet now known as Neptune, and had the good fortune to detect its presence the very evening of the day on which he had received Le Verrier's request to search for it. Upon this the French academy awarded Galle another prize. He has published many scientific papers, and a work on climatology.

GALLE, or POINT DE GALLE, a t. and port in s.w. Ceylon, 72 m. s. of Colombo; pop. '71, 47,059. The fort is a mile in circumference, and commands the entire harbor, but is in its turn commanded by a range of hills. A charming feature of the place is the number and variety of trees in and around the settlement, among them palms, cocoa, and bread-fruit. The harbor is spacious and safe except during monsoons. There is a large trade in cocoa-nut oil, cinnamon, plumbago, and coir. Sir J. E. Tennant is of the opinion that this place was the Tarshish of Solomon. In modern times it had no importance until the arrival of the Portuguese. The English took possession of the whole island in 1796.

GALLIA, a co. in s.e. Ohio, on the Ohio river, drained by Raccoon, Campaign, and Symmes creeks, and intersected by the Dayton and Southeastern railroad; 440 sq. m.; pop. '70, 25,545. It is hilly, and to a large extent covered with forests. The soil is fertile, producing corn, wheat, oats, etc. Co. seat, Gallipolis.

GALLIO, JUNIUS ANNEUS, proconsul of Achaia in the time of Paul the apostle, 53 A.D., son of Annæus Seneca, a Roman rhetorician. His mother's name was Helvia; and L. Annæus Seneca, the philosopher, and L. Annæus Mela, the geographer, were his full brothers, his own proper name being Marcus Annæus Novatus. After receiving a careful education from his father at Cordova, he went to Rome, where he attracted the notice of L. Junius Gallio, a rhetorician of some repute, who ultimately adopted him, thus conferring upon him the name by which he is usually known. It is probable that Gallio shared the misfortune of his brothers when the latter, having incurred the enmity of Messalina, were banished to Corsica; and that all three returned together to Rome, when Agrippina selected Seneca to be tutor to Nero. Towards the close of the reign of Claudius, Gallio received the proconsulship of the newly constituted senatorial province of Achaia, but seems to have been compelled by ill health to resign the post within a few years. In the fifth year of Nero's reign, we hear of him as being again in Rome, and from the same authority we learn that he became one of the last victims of that tyrant.

GALLIPOLIS, a city in Gallia co., Ohio, on the Ohio river, at the terminus of the Gallipolis, McArthur, and Columbus railroad; 56 m. s.e. of Chillicothe. It contains a court-house, the Gallia academy and other schools, several churches, steam flouring-mills, and several important manufacturing establishments. Pop. '70, 3,711.

GALLISSONNIERE, ROLAND MICHEL BARRIN, Marquis de la, 1693-1756; the son of a gen. of the knights of Malta; entered the French navy, 1710; while still only of the rank of capt., was created gov. gen. of Canada, where he displayed great energy in naval construction, and in establishing a line of forts between Canada and Louisiana. The Indians were at first inclined to despise him on account of his small stature, but upon further acquaintance, learned to appreciate his qualities, and he was both loved and respected by them. During his term of office, troubles with the English were frequent. G. was next appointed chief of the bureau of maps and charts, with the rank of *chef d'escadre*. In 1756, he defeated admiral Byng off Minorca (for which defeat Byng was punished with death), but the fatigue and excitement of this action were too severe for Gallissonnière's health; he was obliged to give up the command, and died soon afterwards at Nemours.

GALLITZIN, a princely family of Russia, of which many members have been notable. In 1514, prince MIKHAIL commanded a Russian army against the Poles; he was defeated by Ostrogski, and kept a prisoner 38 years, with his brother Dimitri. Soon after his release, Mikhail died in a convent. Prince VASIL in 1605 espoused the cause of the usurper Demetrius, murdered the son of Boris Godunoff, was rewarded by Demetrius, but at last conspired against him, and was a party to his death. He was also concerned in the conspiracy which overthrew Demetrius's successor, and was the leader of the deputation which offered the Russian crown to the son of Sigismund of Poland. The offer was deemed an insult, and the envoys were imprisoned at Kiev, where Vasil died. Prince VASIL, called the great, b. 1633, fought against the Turks, and became

attaman (chief leader) of the Cossacks. He supported the designs of Sophia against her brother Peter the great, and when the conspiracy was quelled, he was banished to Archangel, where he died. Prince MIKHAIL, b. 1674, was greatly distinguished as a commander in the wars of Peter the great; Catherine created him field-marshal. Prince ALEXANDER, son of prince M., b. 1718, served with distinction under prince Eugene, dying in 1783. DIMITRI, b. 1721, was envoy to Austria, but is better known as the founder of a great hospital in Moscow. Another DIMITRI, b. 1735, was envoy to France and Holland, and distinguished himself as a writer on scientific subjects. His wife AMALIE, b. 1748, became the center of a band of religious writers, and was herself remarkable for literary ability as well as for personal beauty. Prince SERGEI distinguished himself in the wars with the Turks, Poles, and Austrians, from 1794 till 1809. EMANUEL, b. 1804, gained distinction in the Russian army, and as a writer of books of travel.

GALLITZIN, DEMETRIUS AUGUSTINE, Prince, 1770-1840; a Russian missionary priest, son of the Russian ambassador at Paris, prince Gallitzin, and of the princess Amelie von Schmettau. His father was a freethinker, but he was mainly educated by his mother, and owing to her influence became a Roman Catholic in 1787. He was an officer of the Russian guard, and served for a time as a staff officer in the Austrian force in Brabant, but received his dismissal and came to America, where he embraced the opinions of the Sulpitians, studied theology at Baltimore, and in 1795, took priest's orders. He officiated at Conewango, Pa., and other places in the Atlantic states. In 1798, he founded the Roman Catholic town of Loretto, Cambria co., Pa., expending a large fortune in the work. He was known by the name of "father Smith" during this portion of his career, and labored with the greatest zeal. In 1809, he resumed his original name. He wrote *Defense of Catholic Principles; Appeal to the Protestant Public; On the Scriptures*; and other works.

GALLITZIN, ELIZABETH, 1776-1843; a member of the Roman Catholic order of the Sacred Heart, who came to America in 1840 to visit the houses of the order. She was the founder of the establishment in Houston street, New York city, and of other establishments in Pennsylvania and the western states.

GALLIUM, one of the recently discovered elements, named in honor of France. It is a metal, having an atomic weight of 69.9: sp. gr. of solid metal is 5.956, liquid 6.069; melting point 86.37°, so that it liquifies when held in the hand. The liquid metal is silvery white, adhering to glass, and forming a mirror. It may be cooled several degrees below the melting point, if kept undisturbed, but on agitating it by dropping in a piece of the solid metal, it immediately crystallizes in an octohedral form. It may be raised to a red heat without volatilizing. It is not easily attacked by cold nitric acid, but hydrochloric acid readily dissolves it, forming a very deliquescent and soluble chloride. It furnishes also a corresponding bromide and iodide, and an ammonio-gallic alum. As a base it holds a rank between aluminium and indium. It gives with the spectroscope two very brilliant lines in the violet part of the spectrum. Gallium was discovered by Lecoq de Boisbaudran in 1875 in the spectroscopic examination of zinc blende.

GALLOWAY, JOSEPH, LL.D.; 1730-1803; b. Md. He was a lawyer and a member of the Pennsylvania colonial assembly. In 1774, he was a delegate to the first congress, but his sympathies being on the side of England, he became a conspicuous tory. In 1778, he settled in England with his daughter. He published *Speech in Answer to John Dickinson; Candid Examination of the Mutual Claims of Great Britain and the Colonies; Letters to a Nobleman*; and *Reply to Sir William Howe*.

GALLUP, JOSEPH ADAM, 1769-1849; b. Conn., and graduated in medicine at Dartmouth college. In 1800, he settled in Vermont, and began to write for the newspapers. In 1820-23, he presided over the Castleton academy, and about the same time lectured in the university of Vermont. He published *Sketches of Epidemic Diseases in the State of Vermont; Pathological Reflections on the Supertonic State of Disease*; and *Outlines of the Institutes of Medicine*.

GALLUPPI, or GALUPPI, PASQUALE, 1770-1846; an Italian philosopher, educated in the university of Naples. He entered the government service, and was for many years employed in the office of the administration of finances. Though apart from academic influences, he pursued his favorite studies; and it was not till he had reached the age of 60, and had become widely known by his philosophical writings, that he was called to a chair in the university of Naples, which he held till his death. Galluppi's first work was an essay on analysis and synthesis. This was followed by the important *Saggio Filosofico Sulla Critica della Conoscenza*, in 6 vols. In the *Lettere Filosofiche*, etc., by which, through Piccetti's translation into French, he is best known to foreigners, G. traces his own philosophical development from the empiricism of the 18th c. writers, through the Kantian criticism, to his final speculative views, in many respects resembling the doctrines of the Scotch school as amended by Hamilton. His systematic work, *Elementi di Filosofia*, was long used as a text-book for instruction in the Italian colleges. G., though in many respects Kantian, can hardly be said to have fully taken up the speculative significance of the *Critique of Pure Reason*. He accepts the Kantian

demonstrations of the necessary unity of consciousness as the indispensable factor in knowledge, regards our knowledge of the *ego* as knowledge of substance, maintains that in external perception, or, as he puts it, in sensation, we are directly cognizant of the real thing, and holds that the existence of the unconditioned is given in knowledge as the necessary correlate of the conditioned, but rejects entirely the *a priori* element which is the distinguishing characteristic of the Kantian doctrine of cognition. All judgments, according to him, are ultimately identical. On the other hand, G. exaggerates the place and importance of the moral reason; with Kant, he finds objective truth in the ideas of desert and duty, and admits that ethical judgments are *a priori*, without endeavoring to explain, in accordance with his theoretical views, how such judgments are at all possible.

GALLUS, C. CORNELIUS, B.C. 66-26; a Roman poet, orator, and politician, b. in Gaul, of humble origin. Going to Rome he was taught by the same master as Virgil and Varius. In political life, he espoused the cause of Octavianus, and as a reward for his services was made prefect of Egypt. His conduct in this position afterwards brought him into disgrace with Augustus; and, dreading the exposure of his arrogance, extortion, and cruelty, he put an end to his life by throwing himself on his sword. G. acquired among his contemporaries a high repute for intellect. He associated on terms of equality with Virgil, Ovid, Varius, Asinius Pollio, and others; and on account of his four books of elegies, Ovid claimed for him the first place among the elegiac poets of Rome. His fame as an orator was hardly inferior to his renown as a poet; but not a fragment of his composition has descended to our times.

GALOIS, EVARISTE, 1811-32; a French mathematician. Much of his attention was devoted to researches on the resolubility of algebraic equations by radicals. But these researches, crowning as it were the previous labors of Lagrange, Gauss, and Abel, have in a signal manner advanced the theory, and it is not too much to say that they are the foundation of all that has since been done, or is doing, in the subject. The fundamental notion consists in the establishment of a group of permutations of the roots of an equation, such that every function of the roots invariably by the substitutions of the group is rationally known, and reciprocally that every rationally determined function of the roots is invariably by the substitutions of the groups. As part of the theory (also the investigation has a very high independent value as regards the theory of numbers, to which it properly belongs), Galois introduces the notion of the imaginary roots of an irreducible congruence of a degree superior to unity. He was killed in a duel.

GALT, SIR ALEXANDER TILLOCH, b. England, 1817, son of John, the Scotch author. Alexander became manager of the British-American land company, which he rescued from insolvency and brought to a high degree of prosperity. He was interested in the establishment of the railroad from Montreal to Portland. In 1858, he became minister of finance in the Cartier administration in Canada. In 1862 he resigned, and returned to office in 1864, retiring again in 1866. He was one of the commissioners appointed to promote the confederation of the colonies.

GALTON, FRANCIS, b. England, 1822; grandson of Dr. Erasmus Darwin; graduated at Trinity college, Cambridge, 1844; traveled in n. Africa, and on the White Nile, then rarely visited, in 1846, and afterwards undertook the exploration of the western regions of s. Africa in 1850, starting from Walfisch bay. For this journey, of which he afterwards published an account, *Narrative of an Explorer in Tropical South Africa*, he received the gold medal of the royal geographical society, in whose proceedings he subsequently took an active share, first as member of council, and for several years as one of its secretaries. Mr. Galton is also the author of the *Art of Travel, or Shifts and Contrivances in Wild Countries*, a work which has gone through numerous editions, and which has been warmly appreciated by travelers and emigrants; also of *Meteorographica*, the first attempt, on a large scale, to chart the progress of all the elements of the weather, and through which the existence and theory of anti-cyclones was first established by him. He was appointed, on behalf of the royal society, a member of the committee of the board of trade. He has published several works on heredity. He has held office or membership in many scientific societies.

GALUPPI, BALDASSARE, 1706-85; an Italian composer, the son of a barber, educated by Lotti. He wrote an opera when 16 years of age, and it was a failure; but his successful comic opera named *Dorinda*, produced seven years later, laid the foundation of his fame. He was a prolific writer; no less than 70 of his operas are enumerated, though none have kept the stage. G. resided in London between 1741 and 1744; and afterwards was in St. Petersburg till 1768, as imperial conductor of music, in high honor at the court of the czar. Here he produced his best tragic opera. He is said to have introduced Italian church-music in Russia. In 1768, he resumed his position as organist of the cathedral of St. Marks at Venice, to which he had been appointed in 1762, and which had been kept open for him during his absence. When he died he left 50,000 lire to the poor of Venice. His best comic opera bears the title *Il mondo della Luna*.

GALVA, a village in Henry co., Ill., on the Chicago, Burlington, and Quincy railroad, where the Peoria and Rock Island road crosses; 141 m. w.s.w. of Chicago; pop.

2,160. It is in a rich agricultural and coal-mining district, on the divide between the Illinois and Mississippi basins. In 1872, nearly the whole village was burned.

GALVESTON, a co. in s.e. Texas, on Galveston bay and the gulf of Mexico, intersected by the Galveston, Houston and Henderson railroad; 680 sq. m.; pop. '70, 15,290—3,236 colored. The surface is level and the soil sandy. Included in the territory is the long low Galveston island. Co. seat, Galveston.

GALVESTON (*ante*), a city in the co. of the same name in Texas, the chief seaport of the state, on an island between Galveston bay and the Mexican gulf; pop. '70, 13,818. It has railway communication with all parts of the country, and by lines of steamships with Liverpool, New York, New Orleans, and the ports of Texas as far as the Mexican boundary; and sail-vessels engage largely in direct trade with Great Britain and the continent of Europe, in the coffee trade with Rio Janeiro, and in the West India and Mexican trade. There are cotton-presses, with warehouses and yards, occupying upwards of 40 acres of ground, and storing more than 100,000 bales of cotton. There are 10 m. of street-railway, 2 libraries, 15 churches, schools, a Roman Catholic university, a medical school, an orphanage, savings and national banks, iron-foundries, railroad shops, machine-shops, gas-works, hospitals, daily and weekly newspapers. Oranges and other tropical fruits grow in the open air, and vegetable gardens flourish all the year.

GALVEZ, BERNARDO, Count de, 1756-86; b. Spain; a son of the viceroy of Mexico. He was governor of Louisiana, 1776-83. He took Baton Rouge, Natchez, Mobile, and Pensacola from the English, and rose to be captain-general of Florida and Louisiana. In 1784, he was appointed captain-general of Cuba, and immediately afterwards took his father's place as viceroy of Mexico. He was the builder of the castle of Chepul-tepec.

GAM'ALA, an ancient fortress of Palestine, besieged by Agrippa, and captured by Vespasian, when, it is said, 9,000 of the defenders perished. It is supposed to have been on the e. side of the sea of Galilee.

GAMBIER, a village in Knox co., Ohio, on the Vernon river and the Cleveland, Mount Vernon and Columbus railroad; 51 m. n.e. of Columbus; pop. '70, 581. It is the seat of Kenyon college, an institution of the Prot. Epis. diocese of Ohio, comprising, besides the academical department, a theological seminary and a grammar school. See **KENYON COLLEGE**.

GAMBIER, JAMES, Baron, 1756-1833; an English admiral, b. Bahamas, where his father was lieut. governor. He entered the navy as a midshipman in 1767, was post captain in 1778, and after the peace with America was placed on half pay. On the commencement of the French revolution, he was appointed to the command of the 74-gun ship *Defense* under lord Howe; and had an honorable share in the action off Ushant, June, 1794. In recognition of his services on this occasion, G. received the gold medal, and was made a colonel of marines; the following year he was advanced to the rank of rear-admiral, and appointed one of the lords of the admiralty. In 1799, he was made vice-admiral. In 1802, he was appointed governor of Newfoundland and commander-in-chief of the ships on that station. In 1804, he returned to the admiralty, and in 1805 was raised to the rank of admiral; and in the summer of 1807, whilst still a lord of the admiralty, he was appointed to the command of the fleet ordered to the Baltic, which, in concert with the army under Lord Cathcart, reduced Copenhagen and enforced the surrender of the Danish navy, consisting of 19 ships of the line, besides frigates, sloops, gun-boats, and naval stores. For this service admiral G. was rewarded with a peerage. In the spring of the following year he gave up his seat at the admiralty on being appointed to the command of the channel fleet; and in that capacity he witnessed the partial, and prevented the total, destruction of the French fleet in Basque roads, April 12, 1809. It is in connection with this event that lord Gambier's name is now best known. A court-martial, assembled by order of a friendly admiralty, and presided over by a warm partisan, "most honorably acquitted" him on the charge "that, on April 12, the enemy's ships being then on fire, and the signal having been made that they could be destroyed, he did, for a considerable time, neglect or delay taking effectual measures for destroying them." In 1814, he acted as chief commissioner for negotiating a treaty of peace with the United States; for his exertions in which business, he was honored with the grand cross of the bath. In 1830, he was raised to the high rank of admiral of the fleet.

GAMELYN, the hero of an English legend interesting only as furnishing Shakespeare with the plot of *As You Like It*. The story relates that G. was the youngest of three sons of sir John de Boundy. The eldest son took charge of him, but treated him shamefully. He sent his servants to chastise the youngest, having already demanded his heritage; but G. beat them off. At a wrestling match he threw the champion, and carried off the prize ram; but on reaching home and finding the door shut against him, he kicked down the door and threw the porter into a well. The elder brother, by a maneuver, contrived to bind the young scapegrace to a tree, and left him two days without food; but Adam, the spencer, unloosed him, and G. fell upon a party of ecclesiastics who had come to dine with his brother, "sprinkling the holy water on the guests with

his stout oaken cudgel." The sheriff now sent to take G. and Adam into custody; but they fled into the woods and came upon a party of foresters sitting at meat. The captain gave them welcome, and in time G. rose to be "king of the outlaws." His brother, being now sheriff, would have put him to death, but G. captured him, constituted himself a judge, and hanged his brother. After these strange exploits, the king appointed him chief ranger; he married, and seems to have grown more peaceable.

GAMES, ANCIENT. The public games of Greece and Rome were athletic contests and spectacles of various kinds, generally connected with religious observances. Probably no institution exercised a greater influence than that of the public contests of Greece in molding the national character and producing that unique type of physical and intellectual beauty reflected in Greek art and literature. From the noble spectacle of the Greek Olympia the course of public games can be traced downward to the Roman amphitheater, of whose degradation and horror a faint picture may be formed from its last survival—the Spanish bull-fight. The earliest games of which there is any record are those at the funeral of Patroclus, which form the subject of the 23d Iliad. They are noticeable both as showing that the belief that the dead would be appeased or gratified by the same exhibitions which pleased them in life was a common heritage of Greeks and Romans from their Aryan progenitors; and as already including all the distinctive competitions which we find in historical times—the chariot-race, archery, boxing, wrestling, and putting the weight. Each of the great Grecian games was held near some shrine or consecrated spot, and is connected by myth or legend with some hero, demigod, or local deity. See OLYMPIC GAMES, PYTHIAN GAMES, NEMEA, ISTHMUS, CIRCUS, and AMPHITHEATER, *ante*.

GAMMELL, WILLIAM, LL.D., b. Mass., 1812; a graduate of Brown university, and a tutor there; professor of rhetoric and English literature, and afterwards of history and political economy. Besides many contributions to the periodical press, he has published *Life of Roger Williams*; *Life of Gov. Samuel Ward*; and *History of American Baptist Missions*.

GANDERSHEIM, a t. in Germany, at the head of a circle in the duchy of Brunswick, situated on the Gande, a sub-tributary of the Weser, about 48 m. s.w. of Brunswick; pop. '75, 2,454. It has manufactures of linen, cigars, beet-root sugar, and beer; and possesses an old palace built by the dukes of Brunswick in the 16th c., and an abbey which is one of the most famous in Germany. The abbey of G. was founded in 856, according to Eberhard's chronicle by the duke Ludolf of Saxony, and his wife Oda, who removed to the new domicile the nuns whom they had shortly before established at Brunshausen. Their own daughter, Hathumoda, was the first abbess. King Louis III. granted a privilege by which the office of abbess was to continue in the ducal family as long as any member was found competent and willing to accept the same. Otto III. gave the abbey a market, a right of toll, and a mint. Pope Innocent III. declared it altogether independent of both bishop and archbishop. The abbey was ultimately recognized as holding directly of the empire, and the abbess had a vote in the diet as a member of the Rhenish bench of bishops. The conventual estates were of great extent, and among the feudatories who could be summoned to the court of the abbess were the elector of Hanover and the king of Prussia. Protestantism was introduced in 1568, and Magdalena, the last Roman Catholic abbess, died in 1589; but Protestant abbesses were appointed to the foundation, and continued to enjoy their imperial privileges till 1802, when G. was incorporated with Brunswick. The last abbess was a princess of the ducal house, and kept her rank till her death. The abbey has also a celebrity through its literary memorials.

GANE'LOH, Count of Mayence, one of Charlemagne's paladins, called the "Judas" of knights. It is said that his castle was built on the Blocksberg, the loftiest peak of the Harz mountains. Jealousy of Roland made him a traitor; and in order to destroy his rival, he planned with Marsillus, the Moorish king, the attack of Roncesvalles. He was six and a half feet high, with glaring eyes and fiery hair; he loved solitude, was very taciturn, disbelieved in the existence of moral good, and never had a friend. His name is a by-word for a traitor of the basest sort.

GAN'ESA, in Hindu mythology, son of Siva and Parbutta; also called Gunputty, the elephant god. He has been called the Mercury of the Hindus—the god of wisdom, forethought, and prudence.

GANGRA, COUNCIL OF, held at Gangra, in Paphlagonia, about 370 A.D., against Eustathius of Sebaste, who was the first preacher of the ascetic life in the countries around Pontus, where his disciples became numerous. He taught that it is unlawful to marry and to eat certain meats; separated several married persons, and advised those who disliked the public offices of the church to communicate at home. He wore, and imposed on his disciples, a distinctive dress, compelled women to cut off their hair, and directed his followers to shun, as profanation, the communion and benediction of a married priest. In opposition to these and similar views, of which some have since been held by the church of Rome, the council published 21 canons condemning those who pronounced marriage unlawful, who forbade the eating of meat, refused to receive the communion at the hands of a married priest, wore a peculiar dress as a mark of unusual strictness,

forsook their husbands through a false horror of marriage, and deserted their children or their parents, under pretext of leading an ascetic life.

GANNAL, JEAN NICOLAS, 1791-1852; a French chemist. In 1808, he entered the medical department of the French army, and in the campaign of 1812 he witnessed the disastrous retreat from Moscow. After the downfall of the empire he obtained a situation at the école polytechnique in Paris, and subsequently acted as chemical assistant to Thenard. He devised a method for the refining of borax, by which the price of that salt was reduced from 6 francs to 60 centimes per lb. He was the first to introduce into printing the use of elastic rollers, which he formed of a mixture of gelatine and sugar; and his process for the melting of tallow and hardening it with acids prepared the way for the manufacture of wax-candles. His experiments with gelatine demonstrated the incorrectness of the opinion that it possessed highly nutritive properties. He obtained one of the Monthyon prizes of the institute in 1835 for the discovery of the efficacy of injections of solutions of acetate and chloride of aluminium in preserving anatomical preparations. He accomplished embalment without mutilation of the body, and with economy, by injecting into one of the carotid arteries solutions of aluminium salts.

GANNETT, EZRA STILES, D.D., 1801-71; b. Mass.; a graduate of Harvard and Cambridge divinity school; entered the ministry of the Unitarian church and became a colleague of Dr. William E. Channing. He was pastor of the Federal-street church, Boston, which removed subsequently to Arlington street, from 1824 until his death. He was the founder of the *Scripture Interpreter*, edited the *Monthly Miscellany*, and assisted on the *Christian Examiner*. Many of his sermons have been published. He was an earnest preacher, a strong and keen-controvertist, an eloquent orator, and a faithful pastor. He was one of the leaders of the earlier or conservative Unitarianism.

GANO, STEPHEN, 1762-1828; b. New York. He was a surgeon in the continental army. In 1786, he was ordained a minister, and for 30 years had charge of the first Baptist church, Providence, R. I.

GANS, EDUARD, 1798-1839; a German jurist, of Jewish descent; the son of a banker, educated at Berlin, Göttingen, and Heidelberg; in 1825, became professor extraordinarius at Berlin. At this period the historical school of jurisprudence was coming to the front, and G., who in philosophy was a strong Hegelian, applied the method to one special branch of legal relations—the right of succession. His great work, *Erbrecht in rechtsgeschichtlichen Entwicklung*, is still of permanent value, presenting the slow evolution of legal relations. G. had intimate acquaintance with the knot of brilliant writers and lecturers, Cousin, Villemain, Michelet, and Quinet, who then made Paris the center of literary culture and criticism. The liberality of his political views drew the displeasure of the Prussian government, and in 1835 his course of lectures on history of the last fifty years, afterwards published, was prohibited. Beside other published works, G. edited the *Philosophie der Geschichte* in Hegel's *Werke*, and contributed an admirable preface.

GANSEVOORT, PETER, JR., 1749-1812; b. New York. In 1775, he was appointed major of the 2d New York regiment, and accompanied Montgomery in the invasion of Canada. The following year, having been made lieutenant-col., he was in command of fort George, and in 1777 defended fort Stanwix against the British and Indian siege, conducted by St. Leger, for three weeks, thus detaining the latter from co-operating with Burgoyne. For this service he received the thanks of congress. He was appointed by the state of New York brig. gen. in 1781, and in 1809 received the same rank in the regular army of the United States. He filled successively the offices of commissioner of Indian affairs, commissioner for fortifying the frontiers, and military agent.

GARAKONTHIE, DANIEL, d. 1675; the chief of the Onondaga Indians and had great influence in the councils of the five nations, always endeavoring to keep peace with the French, preventing war expeditions, and rescuing prisoners. He embraced Christianity and was baptized by bishop Laval of Quebec in 1670.

GARAT, DOMINIQUE JOSEPH, 1749-1833; a French statesman and contributor to newspapers. In 1785, he was named professor of history at the Paris atheneum, where his lectures enjoyed an equal popularity with those of Laharpe on literature. Possessing strongly optimistic views, a mild and irresolute character, and indefinite and changeable convictions, he acted an undignified part in the great political events of the time, and became a tool in carrying out the designs of others. He succeeded Danton as minister of justice in 1792, and in this capacity had intrusted to him what he called the *commission affreuse* of communicating to Louis XVI. his sentence of death. In 1793, he became minister of the interior, and during the reign of terror, he was imprisoned, but received his liberty after the revolution of the 9th Thermidor, and was named minister of public instruction. In 1798, he was appointed ambassador to Naples, and in the following year he became a member of the council of ancients. After the revolution of the 18th Brumaire, he was chosen a senator by Napoleon and created a count. During the hundred days he was a member of the chamber of representatives, and strongly opposed the recall of the Bourbons. In 1803, he was chosen a member of the institute of France, but after the restoration of Louis XVIII. his name was, in 1816, removed from the list of members. After the revolution of 1830, he was

named a member of the new academy of moral and political science. His writings are characterized by elegance, grace, and variety of style, and by the highest rhetorical eloquence; but his grasp of his subject is superficial, and as his criticisms have no root in fixed and philosophical principles they are not unfrequently whimsical and inconsistent. He must not be confounded with his elder brother Dominique, 1735-99, also a deputy to the states-general.

GARBO, RAFFAELLINO DEL, 1466-1524; a Florentine painter, a pupil of Filippino Lippi, with whom he remained till 1490, or later. Showing great facility in design, he excited hopes which he did not fulfill. He married and had a large family; embarrassments and careless work ensued, and finally he lapsed into a dejected and penurious condition. Three of his best *tempera* pictures are in the Berlin gallery; one of the Madonna standing with her infant between two musician-angels is particularly attractive. His oil-painting of the "Resurrection" done for the church of Monte Oliveto, Florence, now in the academy of the same city, is ordinarily reputed his masterpiece. Angelo Allori was his pupil,

GARDEN, ALEXANDER, 1728-92; b. Scotland; physician and naturalist; studied in Aberdeen under Dr. Gregory, and took up his residence in Charleston, S. C., where he gained fortune and reputation. He was a correspondent of Linnaeus, and author of a number of scientific papers on botany and animals.

GARDEN, ALEXANDER, 1757-1829; b. S. C. He was aide-de-camp to gen. Greene, and author of anecdotes of the revolution, with sketches of distinguished persons of the southern states in that period.

GARDEN CITY, a village on Long island founded by the late Alexander T. Stewart. It is on Hempstead plains, about 18 m. from New York *via* the Long Island railway. The land was originally a part of a large, sandy plain, and after its purchase by Mr. Stewart from the village of Hempstead, it was graded, drained, and laid out in a village surrounding an open plaza. There is a first-class hotel bearing the name of the city, and a number of pretty cottages, the whole having the appearance of a toy village spread out on a table. Gas and water works have been constructed, and a large portion of the adjoining land is farmed by the estate. It is now the cathedral city of the Prot. Episcopal diocese of Long island, and a noble cathedral and bishop's residence are being built by Mrs. Stewart as a memorial of her husband. The building, of sandstone, in Gothic architecture, is now rapidly approaching completion. There are also grand structures for collegiate, academic, benevolent, and ecclesiastical purposes, to be grouped around the cathedral. See CATHEDRAL. The Queen's county hunt have their kennels near Garden City, on a farm belonging to Mrs. Stewart, and the hunt dinners usually take place at the hotel. The population as yet is not large; rents are low, to approved applicants only. It is reached by train from Hunter's point (ferries from Pine st., James slip, e. 7th, and e. 34th sts.) almost hourly during the day.

GARDINER, JOHN, 1731-93; b. Boston; son of Sylvester; studied law; was called to the bar in England, and practiced in London and in Wales; was one of the counsel for Wilkes in 1764; was in the Massachusetts legislature 1789-93; procured the abolition of the law of primogeniture in Massachusetts, the prohibition of special pleading, and the repeal of the theatrical laws. He was one of the leaders of the original Unitarian movement in Boston, 1787. He was drowned off cape Ann.

GARDINER, JOHN SYLVESTER JOHN, D.D., 1765-1830; b. Wales. He was educated by John Lovell of Boston, and for six years was a pupil of Dr. Parr in England; was ordained, 1787, by bishop Provost, and was in charge of the Prot. Episcopal parish of St. Helena, S. C., 1787-91; assistant minister and rector, after 1805, of Trinity church, Boston.

GARDINER, SYLVESTER, 1707-86; b. R. I.; studied medicine in Paris and London, and began practice in Boston. In 1760, he was the leader in founding the present city of Gardiner, Kennebec co., Me., the colony being composed almost entirely of Germans. He established a church and library there, and was one of the founders of King's chapel, the first Episcopal church in Boston. In the revolution he was a loyalist, and in the first year of the war went to England. He came back in 1785, and settled at Newport, where he died.

GARDINER'S ISLAND, a portion of Suffolk co., N. Y., at the entrance of Long Island sound; has an area of 3,300 acres, and has been the property of the Gardiner family ever since the white settlement of the country. It is used mainly for pasture, and the raising of cattle and sheep. It was on this island that the noted pirate (or privateer) capt. Kidd secreted much of his treasure, which was afterwards discovered and appropriated by the finders. There is a light-house on the n. part of the island.

GARDNER, JOHN LANE, 1793-1869; b. Boston; entered the army 1812, and was in service in Canada in the war with Great Britain, where he was wounded. In times of peace he filled various positions, and for service in the Florida war was made major, and had further promotion for gallant conduct in the Mexican war. He was col. at fort Moultrie in 1860, and secretly prepared to defend the fort against the anticipated attack, though he had less than 50 men. The secretary of war (Floyd, who went over

to the confederacy) discovered his purpose, and ordered him to Texas, maj. Anderson taking his place in Charleston harbor. Four years before his death he was made brig.-gen. for long and faithful service.

GARE FOWL. See *AVK*, *ante*.

GARFIELD, JAMES ABRAM, b. in Cuyahoga co., Ohio, Nov. 19, 1831. Early left fatherless, his youth was spent in alternate periods of study at school and hard manual work for his own support. He worked on a farm, and is said to have driven horses on the Ohio canal. He learned the carpenter's trade, and worked at it during his school vacation in 1850. He had already entered the Geauga seminary at Chester, Ohio, where he began the study of Latin, Greek, and algebra. In 1851, he entered the Western Reserve Eclectic institute at Hiram, Ohio, where, in 1853-54, he was at once a student and teacher. In 1854, he entered Williams college, Mass., where he graduated with distinguished honor in 1856. He became classical teacher in the institute at Hiram, Ohio, of which he was elected the head one year later. Before entering college, he had united with the Disciples' church, in which he had been brought up, and, according to the usage of that denomination, though never formally ordained to the ministry, he often preached. In 1858, he entered his name as a student with a law firm in Cleveland, though his study was carried on by himself at Hiram. Graduating from college in 1856, at the time of the organization of the republican party, he cast his first vote that year for its candidate, and took part in the campaign in several speeches. In 1859, he was elected to represent the counties of Portage and Summit in the Ohio state senate. In this office he was an able debater and an industrious committee-man; and, as secession appeared in 1860-61, he contributed much to direct public sentiment and make ready for national defense. In Aug., 1861, he was appointed lieut.col. of volunteers, and in Sept., colonel. In Dec., he reported for duty to gen. Buell at Louisville, Ky., and was ordered, in command of a brigade of four regiments of infantry, to repel the rebels under gen. Humphrey Marshall from the valley of the Big Sandy river. He accomplished this task in Jan., 1862, defeating Marshall in the battle of Middle creek, and forcing him to retreat from the state. He was commissioned brig.gen., given command of the 20th brigade, and ordered to join gen. Buell. He reached, with his brigade, the field of Shiloh on the second day of the battle, and aided in the final repulse of the enemy; and next day, at the front with Sherman, took part in the attack on the enemy's rear-guard. He participated in the siege of Corinth, and, after its evacuation, was detailed to rebuild the railroad to Decatur. In Oct., 1862, he served on a court of inquiry, and in Nov. on the court-martial which tried gen. Fitz-John Porter. In Feb., 1863, he joined the army of the Cumberland under Rosecrans, just after the victorious but severe battle of Stone river, and was appointed chief of staff. In the discussion in regard to a forward movement, G., as chief of staff, collated the written opinions of the seventeen corps, division, and cavalry generals, and summarized their substance with cogent arguments of his own in a report which Mr. Whitelaw Reid pronounces "the ablest military document submitted by a chief of staff to his superior during the war." This report induced Rosecrans to move forward, contrary to the opinions of most of his generals, in the Tullahoma campaign, opening the way for the advance on Chattanooga. In the battle of Chickamauga, Sept. 19, G. issued the orders, as chief of staff, and, during the temporary reverse in the midst of the battle, rode under fire across the country, and took word to Thomas, commanding the left wing, of the necessities of the situation, and, under Thomas, assisted in retrieving the disaster. G. was sent to Washington with dispatches, and was made maj.gen. for his services at the battle.

Having been elected a representative in congress, he resigned his commission, Dec. 3, 1863, and took his seat in the house of representatives, where he served as member of the military committee until the close of the war. Largely through his efforts and arguments, the commutation clause of the enrollment act was repealed, and the draft enforced at a time when otherwise the army would have been fatally depleted. Jan. 28, 1864, he delivered a speech on the seizure and confiscation of rebel property. In Mar., 1864, he spoke on free commerce between the states; and Jan. 13, 1865, on the constitutional amendment abolishing slavery. In 1865, he was assigned to the committee of ways and means, and Mar. 16, 1866, made an elaborate speech on the public debt and specie payments. In July following, he spoke on the revision of the tariff. In 1867-68, he took strong ground against the inflation of the currency. In Dec., 1867, he returned to the military committee as chairman, and held that place during the discussions on the reconstruction of the states lately in rebellion, delivering a speech, Jan. 17, 1868, on the power of congress in this relation, in which he severely criticised the action of the president, and the course of maj.gen. Hancock in his celebrated "order No. 40." He also sustained the motion to impeach the president.

In May, 1868, he made an argument on the currency, and July 15, on taxing U. S. bonds. In the next congress, he was chairman of the committee on banking and currency, and of a special committee to investigate the causes of the gold panic in Sept., 1869, which culminated in "black Friday." He also drafted a bill for the taking of the census of 1870, which was rejected by congress, but was made the basis of the law passed ten years later for the census of 1880. In 1871-75, he was made chairman of the

committee on appropriations. In this office, he introduced many important reforms. He also discussed, April 4, 1871, the enforcement of the fourteenth amendment of the constitution, in which he condemned extreme theories both of centralization and local independence. In 1873, he was special commissioner in the removal of the Flathead Indians to the Jocko reservation. In 1873, charges of corruption were made against him in relation to the *Crédit Mobilier*. These excited earnest attention, especially in his own congressional district. He defended himself before his constituents in a pamphlet, as well as in personal speeches. After earnest discussion, he was renominated by a three-fourths vote of the convention, and re-elected by a large majority. The charges were renewed two years later, but were met with greater strength. In 1876, there was no opposition in the convention, and in 1878, he was re-elected by a large majority. In the 44th congress, 1875-77, the democratic party were in the majority. G. became a member of the committee of ways and means. He was a frequent and careful speaker on important measures, and was recognized as one of the leaders of the minority. After the presidential election of 1876, he was one of the prominent republicans requested to witness the counting of votes in Louisiana, and one of two republican members appointed by the house of representatives to sit on the electoral commission. In Dec., 1876, he was nominated by his party for speaker of the house of representatives, and received the same nomination on two subsequent occasions. In the 45th congress, 1877-79, he earnestly advocated the resumption of specie payments, delivering elaborate speeches in congress, and, as a recognized financial leader, a public address on the same subject in Chicago, Jan. 2, 1879. He spoke against the Bland silver bill, and in June, 1878, on the protective tariff, following up the discussion with speeches on the sugar tariff, and pulp and paper, and a careful minority report on hoop, band, and scroll iron. He also spoke, Feb. 19, 1878, on the pacification of the south and the prosecutions in Louisiana. In the extra session called to provide appropriations left unmade by the 45th congress, G. delivered, Mar. 29, a speech on "revolution in congress," in which he strongly assisted the passage of necessary appropriation bills without "political riders." In 1880, he was elected by the Ohio legislature U. S. senator for six years from Mar. 4, 1881.

In the republican national convention in Chicago, June, 1880, he was an earnest advocate of the nomination of John Sherman, of Ohio. The convention was divided between the advocates of gen. Grant, and an opposition favoring James G. Blaine, John Sherman, and others. G. was not at first considered a candidate, but after more than thirty ballots without a choice, and earnest discussions in which, and in the advocacy of his favorite candidate, he won the admiration of all sections, he received the nomination.

With the political ability displayed in his long and busy service in congress, he combines a rare familiarity with history, a refined literary culture, and warm magnetic power in oratory; and has been said to present higher qualities of statesmanship and personal culture than any presidential candidate of either party since Henry Clay. His literary culture appears in historical and financial articles contributed to the *North American Review* and other periodicals.

GARGANTUA, one of the satirical conceptions of Rabelais, variously interpreted by different authorities, some finding in it a political, and others a moral significance. Briefly, it epitomizes the career of Gargantua (son of Grangousier and Garganelle), who, soon as he was born, shouted for drink, so loudly that his voice reached the confines of his father's domains. The king exclaimed "*Que grand tuas!*" and the courtiers accepting the exclamation as conveying a name, it became corrupted into Gargantua. Every reader of Rabelais is familiar with the extraordinary adventure of the wonderful being, whose capacities in every respect were so enormous that in his infancy it required the milk of 17,913 cows to nourish him, and in his maturer days a salad for him was represented by lettuces so large that he swallowed with them six pilgrims who had taken refuge beneath them. Critics desirous of finding the meaning of this satire entirely political, assume that it referred to Francis I. and the intrigues of his court, whilst those who expect to trace in it a moral as well as political interpretation, conceive that it applies to the religious reforms and theological differences of the age.

GARGANTUAN, a term suggestive of boundlessness. Thus a gargantuan course of study, means one including all sources of knowledge, suggestive of the "bottomless pit of learning," which was the only thing likely to satisfy the prodigious mental capacity of Gargantua.

GARGET ROOT. See POKE.

GARIHWAL, a district of British India, in the Kumáon division, under the jurisdiction of the lieutenant-governor of the North-western Provinces, situated between 29° 16' and 31° 5' n., and 78° 18' and 80° 8' e., and bounded on the n. by Chinese Tibet, on the e. by Kumáon district, on the s. by Bijnor district, and on the w. by Independent Garhwal or Tehri. Garhwal district consists almost entirely of rugged mountain ranges running in all directions, and separated by narrow valleys, which may almost be described as gorges or ravines. The only level portion of the district consists of a narrow strip of waterless forest, between the southern slopes of the hills and the fertile plains of Rohilkhand. The highest mountains are in the n. of the district, the principal

peaks being Nanda Devi (25,661 ft.), Kamet (25,413 ft.), Ircoul (23,382 ft.), Dunagiri (23,181 ft.), Badrinath (22,901 ft.), and Kedarnath (22,853 ft.). The Alaknanda, one of the main sources of the Ganges, receives with affluents the whole drainage of the district. The river is regarded as of peculiar sanctity, and is annually resorted to by thousands of devout Hindus. At Deoprayag the Alaknanda joins the Bhagirathi, and thenceforward the united streams bear the name of the Ganges. Navigation is impracticable in all the rivers, owing to the velocity of their currents, and the existence of shoals and rapids. Cultivation is principally confined to the immediate vicinity of the rivers, which are employed for purposes of irrigation; but out of a total estimated area of 5,500 sq. m. in 1872, only 209 were returned as under cultivation. Agriculture, however, is carried on with great skill and industry, by terracing out the hill-sides. Wheat, rice, and mandu are the staple crops, the surplus produce being exported to Tibet. Tea planting is also carried on under European supervision. Garhwal originally consisted of 52 petty chieftainships, each chief with his own independent fortress (garh). Between 400 and 500 years ago, one of these chiefs, Ajai Pal, ruler of Champur, reduced all the minor principalities under his own sway, and founded the Garhwal kingdom. He and his ancestors ruled over Garhwal and the adjacent state of Tehri, in an uninterrupted line till 1803, when the Gurkhas invaded Kumaon and Garhwal, driving Prithiman Sah, the Garhwal chief, into the plains. For 12 years the Gurkhas ruled the country with a rod of iron, until a series of encroachments by them on British territory, led to the war with Nepal in 1814. At the termination of the campaign, Garhwal and Kumaon were converted into British districts, while the Tehri principality was restored to Prithiman Sah, whose grandson still holds it. Since the annexation, Garhwal has rapidly advanced in material prosperity.

GARLAND, a co. in w. Arkansas, on the Ouchita river, reached by a branch of the Cairo and Fulton railroad; formed since 1870. It is hilly, with fertile soil, producing cotton, corn, etc. It has mineral and medicinal springs, and pine forests. Co. seat, Hot Springs.

GARLAND, AUGUSTUS H., b. Tenn., 1832, and early settled in Arkansas as a lawyer. He opposed secession, but went with his state at last. He was elected to the provisional congress of the confederate states in 1861; was re-elected to the house of the same congress in 1862; was afterwards elected to the confederate senate, which office he held till the surrender in 1865. After the war he devoted himself to his profession, and in 1874 was elected governor under the new constitution of Arkansas.

GARNIER, JEAN LOUIS CHARLES, b. Paris, 1825; studied sculpture at the special school of design, and at the school of fine arts, having for instructors Leveil and Hippolyte Lebas. He traveled in Greece, where he made careful measurements of the temple of Jupiter in the island of Egina, and exhibited at the universal exposition in 1855, a polychromatic design for its restoration. In 1856, he wrote a paper explanatory of his design, which was published in the *Revue Archéologique*. A number of his paintings in water-colors were exhibited in the salons of 1857, 1859, and 1863. His plan for the new opera-house in Paris was unanimously chosen by count Walewski and the jury associated with him in 1861, over all competing plans; and G. was intrusted with the execution of this work. He was appointed inspector-general of civil constructions in Paris in 1877; was awarded the great prize in architecture in 1848, obtained a third-class medal at the salon of 1857, and a first-class medal in 1863, and was decorated with the cross of the legion of honor in 1864, and made an officer of the legion of honor on the opening of the new opera-house in 1875.

GARNIER, MARIE JOSEPH FRANÇOIS, 1839-73; usually called Francis Garnier; a French officer and explorer, perished by assassination in Tong-king. He entered the navy, and after voyaging in Brazilian waters and the Pacific, he obtained a post on the staff of admiral Charner, who from 1860 to 1862 was campaigning in Cochinchina. After some time spent in France, he returned to the East, and in 1862 he was appointed inspector of the natives in Cochinchina, and intrusted with the administration of the town of Cho-len or Sho-len. It was at Garnier's suggestion that the marquis de Chasseloup-Laubat determined to send a mission through Laos to Tibet, but as he was not considered old enough to be put in command, the chief authority was intrusted to capt. Doudart de Lagree. In the course of the expedition from Cratieh in Cambodia to Shanghai, 5,392 m. were traversed; and of these, 3,625 m., chiefly of country unknown to European geography, were surveyed with care, and the positions fixed by astronomical observations, nearly all taken by Garnier himself. Volunteering to lead a detachment to Talifu, the capital of sultan Sulcinan, the sovereign of Mohammedan rebels in Yunnan, he successfully carried out the perilous enterprise. When shortly afterwards Lagree died, Garnier naturally assumed command of the expedition, and he conducted it in safety to Yang-tse-Kiang, and thus to the Chinese coast. On his return to France he was received with enthusiasm. His experiences during the siege of Paris were published anonymously in the feuilleton of *Le Temps*, and appeared separately as *Le Siège de Paris: Journal d'un Officier de Marine*, 1871. Returning to Cochinchina, he found the political circumstances of the country unfavorable to further exploration, and accordingly he went to China, and in 1873 followed the upper course of the Yang-tse-Kiang to the waterfalls. He was next commissioned by admiral Dupré, governor of

Cochin-China, to found a French protectorate or a new colony. On Nov. 20, 1873, he took Hanoi, the capital of Tong-king, and on Dec 7 he was slain.

GARNIER-PAGÈS, LOUIS ANTOINE, 1803-78; b. Marseilles; a French politician. He was chosen to the chamber of deputies in 1842, and once took high rank as a leader of the opposition and a promoter of reform agitation. In Feb., 1848, he was made a member of the provisional government, subsequently mayor of Paris, and in Mar., minister of finance. In May, he was one of the executive committee of five appointed by the assembly. In 1864, he was a member of the corps legislatif devoting himself especially to financial matters. At the fall of the empire, he was made a member of the government of national defense. He retired to private life in 1871. He published several works concerning the revolution in Paris.

GARRARD, a co. in e. central Kentucky, on the Kentucky river, intersected by a branch of the Louisville and Great Southern railroad; 250 sq.m.; pop. '70, 10,276—3,404 colored. Surface undulating, and soil fertile, producing corn, wheat, etc. Co. seat, Lancaster.

GARRARD, JAMES, 1749-1822; b. Va.; served in the revolutionary war, and in the Virginia legislature. He eventually settled in Kentucky, and in 1796 was made governor of that state, a position which he continued to occupy until 1804.

GARRARD, KENNER, b. Ky., 1828; an American officer, graduated at West Point, and passed through the various grades, until, in 1863, he was appointed col. of New York volunteers. He took part in the battles of Fredericks-burg, Chancellorsville, and Gettysburg, and served in the army of the Potomac as brig.gen. of volunteers. From this date until his resignation in 1866, he was continually in active service, distinguishing himself more particularly as leader of the party which, in the campaign against Mobile, undertook the storming of Blakely.

GARRETT, a co. in n.w. Maryland bordering on Pennsylvania and West Virginia, bounded by the Potomac, and intersected by the Baltimore and Ohio railroad; 670 sq.m.; pop. '72, 10,857. It has a mountainous surface, with much forest-land, with abundance of coal and iron. Co. seat, Oakland.

GARRETT, ELIZABETH, b. London, 1837; studied medicine in Middlesex hospital, and in Edinburgh, and received a diploma of M.D., in 1870, from the university of Paris. She has had a large and lucrative practice in London. At the close of 1870, she was elected one of the London (metropolitan) school-board by 20,000 more votes than were cast for any other candidate. In 1871, she married a Mr. Anderson.

GARRETT, THOMAS, b. Darby, Pa., 1783; d. Wilmington, Del., 1871; an abolitionist. He learned the trade of a cutler and scythe-maker, and in 1820 removed to Wilmington, Del., and entered into business as an iron and hardware merchant. In his new home he avowed his anti-slavery opinions without the least reserve, and it was not long before the slaves and colored people generally learned that he was their friend. Though he never enticed slaves to run away, he was always ready to aid them in their flight when they appealed to him for protection from their pursuers. This in a slave state exposed him to great danger; but he was as shrewd as he was bold, and rarely found himself in the clutches of the law. His name was familiar to the slaves of Delaware, Maryland, and Virginia; and during a period of 40 years there was a constant procession of fugitives seeking his protection and aid. Not less than 3,000 of this class were indebted to him for their successful escape. It was rare indeed that one, after passing through his hands, was recaptured. He was compelled to resort to many ingenious devices in this work, but he made no secret of the fact that he was engaged in it; and such was his reputation for success, that few slaveholders thought it worth while to pursue their runaways any further after learning that they had fallen into his hands. Twice he was convicted in the district court of the United States of violating the provisions of the fugitive-slave law, and fined in such sums as to deprive him of nearly all his property. On the last of these occasions, the judge, in pronouncing sentence, expressed the hope that the penalty imposed would teach him a useful lesson. The Quaker thereupon declared in open court, that, no matter what might be the consequences to himself, he should never close his door against the fugitive slave. "It," said he, "there is one now present, let him know that he has a friend in Thomas Garrett." His business would have been utterly broken up at this time, if his fellow-citizens of Wilmington had not volunteered to furnish him all the capital he needed. Such was his reputation for integrity and business ability, that even the banks of Wilmington lent him their aid without any security but his own name. Just before he died, the colored people of Wilmington besought him that they might have the privilege of bearing his body to the grave, and to this request he gave his assent. When he died, the whole city rose up in honor of his memory.

GARRETTSON, FREEBORN, 1752-1827; b. Md. He became a Methodist minister in 1775, traveled in several of the states, and in 1784 was a missionary in Nova Scotia. His late years were passed in New York state. He was one of the earliest to pronounce strongly against slavery, and liberate many slaves out of his own means. In his will he provided for the continuous support of one missionary.

GARROW, or **GARO**, **HILLS**, a district in India on the Brahmaputra river, 3,390 sq. m.; pop. about 50,000. It is well watered and wooded, and very fertile, the chief product being cotton. One of the curiosities of the region is the enormous amount of rain, said to amount to from 500 to 600 in. in a year. There are American missions and eight missionary schools in the district.

GASCOIGNE, **GEORGE**, 1535-77; one of the pioneers of Elizabethan poetry, was the son and heir of Sir John Gascoigne. He studied at Cambridge, and was admitted to Gray's Inn in 1555. His youth was unsteady, and his father disinherited him. In 1565, he had written his tragi-comedy of *The Glass of the Government*, not printed until 1576. In 1566, his first published verses were prefixed to a book called *The French Littleton*, and he brought out on the stage of Gray's Inn two very remarkable dramas, *Supposes*, the earliest existing English play in prose, and *Jacosta*, the first attempt to naturalize the Greek tragedy. Of the latter only the second, third, and fourth acts were from his hands. Soon after this he married. In 1572, there was published *A Hundred Sundry Flowers bound up in one small Posy*, a printed collection of Gascoigne's lyrics, he having started in March of that year to serve as a volunteer under the prince of Orange. He was wrecked on the coast of Holland and nearly lost his life, but obtained a captain's commission, and acquired considerable military reputation. An intrigue, however, with a lady in the Hague, nearly cost him his life. He regained his position, and fought well at the siege of Middleburg, but was captured under the walls of Leyden, and sent back to England after an imprisonment of four months. In 1575, he issued an authoritative edition of his poems under the name of *Poesies*. In the summer of the same year, he devised a poetical entertainment for queen Elizabeth, then visiting Kenilworth; this series of masques was printed in 1576 as the *Princely Pleasures*. Later on in 1575, he greeted the queen at Woodstock with his *Tale of Iliades*, and presented her on next New Year's day with the MS. of the same poem, which is now in the British museum. He completed in 1576 his two most important works, *The Complaint of Philomene*, and *The Steel Glass*, the first of which had occupied him since 1562; they were printed in single volume. Later on in the same year, he published *A Delicate Dict for Dainty-mouthed Drunkards*. He fell into a decline and died at Stamford. We are indebted for many particulars of his life to a rare poem published in the same year by George Whetstone, and entitled *A Remembrance of the Well-employed Life and Godly End of George Gascoigne, Esquire*. In his poem of *The Steel Glass*, in blank verse, Gascoigne introduced the Italian style of satire into our literature. He was a great innovator in point of metrical art, and he pretixed to the work in question a prose essay on poetry, which contains some very valuable suggestions. His great claim to remembrance was well summed up in the next generation by Thomas Nash, who remarked in his preface to Green's *Menaphon*, that "Master Gascoigne is not to be abridged of his deserved esteem, who first beat the path to that perfection which our best poets aspired to since his departure, whereto he did ascend by comparing the Italian with the English." [*Encyc. Brit.*, 9th ed.]

GASCONADE, a co. in e. central Missouri on the Missouri river, with the Missouri Pacific railroad on its w. border, 540 sq.m.; pop. '70, 10,093-80 colored. Surface uneven and mostly covered with timber. Chief products, wheat, corn, oats, and grapes. There are valuable quarries of burr-stone. Co. seat, Hermann.

GASES, **LIQUEFACTION OF**. See **LIQUEFACTION OF GASES**.

GASPARIN, **AGÉNOR ÉTIENNE**, *Compte de*, 1810-71; a French statesman employed in the ministries of instruction and of the interior, and in 1842 elected to the chamber of deputies for Corsica. During the revolution of 1848 he was in the east, and refused to declare in favor of the new constitution. He was opposed to Louis Napoleon, and took up his residence in Switzerland, where he lectured upon economical, historical, and religious subjects. He is best known by his books, among which are *The Uprising of a Great People; or, The United States in 1861*, in which he took the northern view of our civil war; and *America before Europe*. He wrote also for the *Journal des Debats* and the *Revue des Deux Mondes*, and a number of volumes on slavery, Protestantism in France, Christianity and paganism, liberty and morals, a life of Innocent III., etc.

GASPE, a co. in the district of Quebec, Canada, on the river and gulf of St. Lawrence and the bay of Gaspé, and including the Magdalen islands; 4,578 sq.m.; pop. '71, 18,729, of whom about two thirds were French. It has a rough surface, with fertile bottom lands. Lumbering and fishing are the employments. Chief town, Perce.

GASTEIN, a valley in the Austrian duchy of Salzburg, celebrated for its mineral springs. It is a side valley of the upper Salzach valley, and is about 25 m. long and 14 m. broad. It has an elevation of between 3,000 and 3,500 feet. Behind it, to the south, tower the mountains of Malnitz or Nassfeld-Tauern, 7,820 ft. high, and the Ankogel, 10,700 ft. high, and from the right and left of these mountains two smaller ranges run northwards, forming its two side walls. The river Ache traverses the valley, and near Wildbad-Gastein forms two magnificent waterfalls, the upper, the Kesselfall, 200 ft., and the lower, the Barenfall, 280 ft. in height; and near these falls another called the Schleierfall, 250 ft. high, is formed by the stream which drains the Pockhart See. The principal villages are Bockstein, Hof-Gastein, and Wildbad-Gastein, and the population

of the whole valley is about 3,800. Hof-Gastein, with a population of about 1000, possesses gold and silver mines which, in the 16th c., yielded 1180 lbs. of gold and 9,500 lbs. of silver annually. They are now, however, much neglected, and many of the old mines are covered by glaciers. The village contains a military hospital, and in the open platz there is a bust of the emperor Francis I., who, in 1823, caused a conduit upwards of 5 m. long to be constructed for the purpose of conveying the mineral waters thither from Wildbad. Wildbad, the principal watering-place, is visited by upwards of 3,000 persons annually, and among its visitors is the present emperor of Germany. The thermal springs, which were known as early as the 7th c., issue from the granite mountains, and have a temperature of 117° Fahr. They are made use of in cases of nervous affections, general debility, and skin diseases; but the reason of their efficacy is somewhat mysterious, as chemical analysis discovers only a slight difference in the ingredients from those of ordinary spring water. The village is formed chiefly of wooden houses rising above one another in terraces; and there are several fine villas, one of which was constructed by the archduke John of Austria, and has a botanical garden.

GASTEIN, CONVENTION OF, concluded at Wildbad-Gastein, Aug., 1865, between Austria and Prussia, to regulate the relations of these two powers with respect to the duchies of Sleswick-Holstein and Lauenburg, which they had taken from Denmark, and occupied in common. They agreed that Sleswick should be placed entirely under Austrian administration, while Lauenburg should be annexed to Prussia, Austria ceding its part of it for 2,000,000 thalers.

GASTON, a co. in s.w. North Carolina, on the Catawba river; intersected by the Carolina Central and the Atlanta and Richmond Air-line railroads; 330 sq. m.; pop. '70, 12,606—4,172 colored. The surface is varied and the soil fertile, producing wheat, corn, oats, cotton, etc. Some gold is found. Co. seat, Dallas.

GASTON, WILLIAM, LL.D., 1778—1844; b. N. C.; graduated at Princeton, and admitted to the bar in 1798. He served in the state legislature, and in 1813 was elected to congress, where he was one of the leaders of the federalists. In 1835, he was a member of the state constitutional convention, where he advocated the right of free negroes to the suffrage which they then possessed but which the new constitution finally took from them. In 1834, he was appointed a judge of the supreme court and held the office until his death.

GATAKER, THOMAS, 1574—1634; b. London; author of a number of works on Scripture subjects. He was one of the assembly of divines at Westminster, and was one of the warmest opposers of the parliament's proceedings against Charles in 1648.

GATE OF ITALY, that portion of the valley of the Adige in the vicinity of Trent and Roveredo; a narrow gorge between two mountain ridges.

GATES, a co. in n.e. North Carolina, on the Virginia border and the Chowan river; 353 sq. m.; pop. '70, 7,724—3,207 colored. Surface mainly level and covered to a large extent with oak and pine. The n.e. part is occupied by the Dismal Swamp. Productions, corn, cotton, tar, and lumber. Co. seat, Gatesville.

GATE OF TEARS, in the strait of Bab-el-Mandeb, forming the passage from the Red sea into the Indian ocean. It received this name from the early Arabs on account of its dangerous navigation and the number of wrecks that occurred.

GATLING, RICHARD JORDAN, b. N. C., 1818; a mechanic and inventor. While yet a boy he aided his father in making machines for sowing cotton seed, and one for thinning out the plants. He patented a machine for rice sowing, adapting it also to sowing grain in drills. Among his other inventions were a hemp-break, and a steam plow. He is best known as the inventor of the revolving battery which bears his name. (See **GATLING GUN**.)

GATLING GUN, a machine-gun of the mitrailleuse order, invented by Dr. R. J. Gatling of Indiana, in 1861. It has generally 5 or 10 barrels, and each barrel has a corresponding lock. Although the barrels and locks revolve together, the locks have a forward and backward action. By means of the forward motion the cartridges are placed in the chambers of the barrels and the breech is closed when the discharge occurs; while through the agency of the backward motion the empty cartridge cases are extracted. The Gatling gun is fed by feed-cases which are made to fit in a hopper communicating with the chambers. Continuous firing can be carried on at the rate of 1000 shots a minute, as one case is replaced by another as fast as it is emptied. The five-barrel gun weighs 100 lbs., is mounted on a tripod, and can be fired at the rate of 800 shots a minute. The bore of each barrel extends through from end to end, and the breech is chambered to receive a flanged "center-fire" metallic-case cartridge of the kind that are in use for the Springfield rifle and similar arms. The breech ends of all the barrels are screwed into a disk called the rear barrel-plate, which is fastened to the central shaft; the muzzles pass through another disk called the front barrel-plate, on the same shaft. A hollow metal cylinder is fastened upon an extension of the central shaft, and is called the carrier-block, behind which the shaft carries another cylinder because each lock is acted on by a spiral spring acting on a hammer by which the charge is fired. The shaft,

the group of barrels, the carrier-block, and the lock-cylinder, being all connected, revolve together; this revolution is effected by a toothed wheel which is fastened to the shaft and is worked by an endless screw on a small axle placed at right angles to the shaft and furnished outside with a hand crank. When the lock-cylinder revolves it carries the locks around with it, and gives them a longitudinal reciprocal motion by their rear ends sliding along a groove in the inclined surface of the stationary spiral cam, so that the several locks in succession are forwarded towards their respective barrels. The Gatling gun is elevated and lowered like an ordinary field gun, but it has the disadvantage as compared with shell guns of not being able to deliver a curved fire. It is constructed with calibers of 1-in., weight 650 lbs.; .75-in. and .65-in., each weighing 450 lbs.; .55-in., weight 400 lbs.; and .50-in., .45-in., and .42-in., each weighing 200 lbs.

GAUBIL, ANTOINE, 1689-1759; a Roman Catholic missionary, b. at Grillac, in Languedoc. He joined the Jesuits in his 15th year, and in his 34th was sent by them to China. When he arrived there the emperor, Young-Tsching, who had just commenced his reign, was determined to banish the Jesuits. Through Gaubil's address nearly all of them remained undisturbed. In 1736, when Kiang-Loung became emperor, Gaubil, who had acquired an accurate knowledge of the Chinese and Mantchou languages, was appointed chief director of the royal colleges in which the children of the nobility were educated. This office gave him a high standing at the imperial court, which he retained until his death. He was the author of a large number of books on Chinese history, literature, and science.

GAUCHOS. See GUACHOS, *ante*.

GAUDEN, JOHN, 1605-62; the reputed author of *Eikon Basilike*, was b. in Essex, of which parish his father was vicar. He was educated at Bury St. Edmund's, and afterwards at St. John's college, Cambridge. He obtained about 1630 the vicarage of Chippenham, in Cambridgeshire, and the rectory of Brightwell in Berkshire. At the breaking out of the civil war, he was domestic chaplain to Robert Rich, second earl of Warwick, one of the parliamentary leaders, and, being selected to preach before the house of commons in 1640, was presented with a silver tankard in acknowledgment of his discourse. In 1641, he was appointed by the parliament to the deanery of Bocking, in Essex. He became master of the Temple in 1659, as successor to Dr. Ralph Brownrigg, bishop of Exeter, and after the restoration in Nov., 1660, he was appointed to the same diocese. Between 1642, the date of his first published work, and 1660, he published some thirteen or more books, of which number, however, only one appeared prior to the execution of the king. Soon after his appointment to the see of Exeter, he privately laid claim to the authorship of the *Eikon Basilike*, a work commonly attributed at that time to Charles I. This claim Gauden put forth in a correspondence with the lord chancellor Hyde, earl of Clarendon, and the earl of Bristol, from Dec. 21, 1660, to Mar. 31, 1662. The whole question of the claims of Charles I. and Dr. Gauden was discussed at great length, and with considerable ability and ingenuity, from 1824 to 1829 by Dr. Christopher Wordsworth, master of Trinity college, Cambridge, on behalf of the king, and the Rev. H. J. Todd on the side of Dr. Gauden. Fresh evidence, however, has lately turned up in the shape of letters and papers of Charles I. and his ministers, written soon after the execution of the king, which go far to invalidate if not entirely destroy the claim of Dr. Gauden, and to prove that those persons to whom he most confidently appealed in support of his pretensions were the strongest upholders of the king's authorship at the time immediately subsequent to the appearance of the work. Within the last six months (Oct., 1880), Mr. Scott of the British museum has published a book containing the latest documents and authorities upon the subject of the *Eikon Basilike*, of which a limited number of copies only has been issued. In 1662, on the death of Brian Duppa, bishop of Winchester, Dr. Gauden applied to be translated from Exeter to that see, but his claims were set aside in favor of George Morley, bishop of Worcester, and the vacancy thus created was filled by the bishop of Exeter. He lived only four months after this last promotion. [In part from *Encyc. Brit.*, 9th ed.]

GAUERMANN, FRIEDRICH, 1807-62; an Austrian painter, son of the landscape painter Jacob Gauermann. Under his father's direction he began studies in landscape, and he also diligently copied the works of the chief masters in animal painting which were contained in the academy and court libraries of Vienna. In the summer he made art tours in the districts of Styria, Tyrol, and Salzburg. Two animal pieces which he exhibited at the Vienna exhibitions of 1824 were regarded as remarkable productions for his years, and led to his receiving commissions in 1825 and 1826 from prince Metternich and Caraman, the French ambassador. His reputation was greatly increased by his picture "The Storm," exhibited in 1829, and from that time his works were much sought after, and obtained correspondingly high prices. His "Field Laborer" was regarded by many as the most noteworthy picture in the Vienna exhibition of 1834, and his numerous animal pieces have entitled him to a place in the first rank of painters of that class of subjects. The peculiarity of his pictures is the representation of human and animal figures in connection with appropriate landscape and in characteristic situations so as to manifest nature as a living whole, and he particularly excels in depicting the free life of animals in wild mountain scenery. Along with great mastery

of the technicalities of his art, his works exhibit patient and keen observation, free and correct handling of details, and bold and clear coloring. Many of his pictures have been engraved, and after his death a selection of fifty-three of his works was prepared for this purpose by the Austrian Kunstverein (Art Union).

GAULAY MOUNTAINS, a portion of the ridge in West Virginia known as the Cumberland mountains. This term is sometimes specifically applied to the Little Gaulay mountains in Nicholas county. They afford some grand scenery.

GAUR, or **GOUR**, a mediæval city in Bengal. The name signifies "country of sugar." We have the names of dynasties, and partial lists of the kings, which bore the title of lord of Gaur, or Guada, before the first Mohammedan invasion. The last of these dynasties, that of the Senas, or of the Vaidyas, superseded its predecessor, the dynasty of the Palas, about the middle of the 11th century. The most eminent of this dynasty, by name Lakshmanasena, who flourished at the end of the century, is alleged in inscriptions to have extended his conquests to Kanauj (in the Doab), to Nepal, and to the shores of Orissa; this king is said by tradition to have founded the royal city in Guada which in later days reverted to a form of this ancient name (Gaur), but which the founder called after his own name, Lakshmanavati, or as it sounded in the popular speech, Lakhnaoti. The fifth from this king, according to Lassen's list, Lakshmaniya (c. 1160-98), transferred the royal residence to Navadvipa, Nadiya (on the Hoogly river, 70 m. above Calcutta), possibly from apprehension of the rising tide of the Mohammedan power; but here it overtook him. Nadiya was taken about 1198-99 by Mohammed Bakhtiyar Khilji, the general of the slave king Kutbuddin Aibak of Delhi, who became established as governor of Bengal, and fixed his capital at Lakhnaoti. Here he and his captains are said to have founded mosques, colleges, monasteries. Lakhnaoti continued for the most part to be the seat of rulers who governed Bengal and Behar, sometimes as confessed delegates of the Delhi sovereigns, sometimes as practically independent kings, during the next 140 years. From the year 1338, with the waning power of the Delhi dynasties, the kingdom of Bengal acquired a substantive independence which it retained for more than two centuries. One of the earliest of the kings during this period, by name Ilyas (Elias) Shah, whose descendants reigned in Bengal with brief interruptions for nearly 150 years, transferred the seat of government to Pandua (c. 1350), a place about 16 m. n. by e. of Gaur, and to the neighboring fortress of Elkdala, a place often named in Mohammedan notices of the history of Bengal down to the 16th century. At Pandua several kings in succession built mosques and shrines, which still exhibit architecture of an importance unusual in Bengal proper. After some occasional oscillation the residence was again (c. 1446) transferred to Gaur, by which name the city is generally known thenceforward, that of Lakhnaoti disappearing from history. The 24th and last of those whom history recognizes as independent kings of Bengal was Mahmud Shah (1533-34 to 1538-39). In his time the city more than once changed hands, during the struggle between the Afghan Sher Shah and the (so-called) "Great Moghul," Humayun, son of Baber; and on one occasion (1537-38), when Sher Shah was operating against Gaur, we first hear of the Portuguese in the inner waters of Bengal. A party of that nation who had been sent with presents to the court of Gaur had been detained as prisoners by the suspicious Mahmud. But in the straits arising during his resistance to Sher Shah, the Frank prisoners were able to render him good service. Mahmud was followed by several Pathan adventurers, who temporarily held the provinces of the delta with more or less assertion of royal authority. One of these, Suleiman Kirani (1564-65), abandoned Gaur for Tanda, a place somewhat nearer the Ganges. It is mentioned by Ralph Fitch, the earliest of European travelers in India, who calls it "Tanda in the land of Gouren," standing a league from the Ganges. Mu'ini Kahn, Khankhanan, a general of Akbar's when reducing these provinces in 1575, was attracted by the old site, and resolved to readopt it as the seat of local government. But a great pestilence (probably cholera) broke out at Gaur, and swept away thousands, the general-in-chief being himself among the victims. On his death the deprived Pathan prince, Daud, set up his standard again. But he was defeated by the forces of Akbar in a battle at Rajmahal, and taken prisoner. After him no other assumed the style of king of Bengal. Tanda continued for a short time to be the residence of the governors under the "Great Moghuls," but this was transferred successively to Rajmahal and Dacca, in repeated alternation, and finally to Moorsshedabad. Gaur cannot have been entirely deserted, for the Nawab Shuja-uddin, who governed Bengal 1725-39, built a new gate to the citadel. But in history Gaur is no longer heard of, till its extensive remains attracted the curiosity of the English,—the more readily as the northern end of the site approaches within 4 m. of the important factory that was known as English Bazar (among the natives as Angrezabad), which is said to have been built of bricks from the ruins, and which is now the nucleus of the civil station of Malda.

The first specific notice of the city of Gaur, from actual knowledge, is contained in the Persian history called *Tabaqât-i-Nasiri*, which has been partially translated in Elliot's *History of India*. The author visited Lakhnaoti in 1243, but the only particular regarding the city that he mentions is that Ghiyasuddin 'Iwaz, the fourth Mohammedan ruler of Lakhnaoti (who called himself sultan, and according to this writer, struck coin in his

own name), besides founding mosques, etc., carried embanked roads across the low country e. and w. of the city for a space of ten days' journey. These works in part still exist. "Radiating n., s., and e. of the city, . . . embankments are to be traced running through the suburbs, and extending in certain directions for 30 or 40 m." (Ravenshaw, p. 3). The extent of ground over which the remains of Gaur are spread is astonishing; and a large part of it would appear to be still, as well described a century ago, covered with dense wood or with rank jungle of grass and reeds, though in later years cultivation has somewhat extended over the site. What may be called the site of Gaur proper is a space of an oblong form, extending from n. to s. $7\frac{1}{2}$ m., with a breadth varying from $1\frac{1}{2}$ to 2 miles. This area is washed on one of its long sides (the western) by a stream called the Bhagirathi, which undoubtedly occupies a former bed of the Ganges (not to be confounded with the Bhagirathi further s., contributing to form the Hoogly, on which Calcutta stands). Roughly parallel to the eastern side, but at a distance varying from 2 to 6 m., runs the river Mahananda, whilst extensive swamps and sheets of water are interposed between this river and the city. The extensive area of which we speak has been defended on n., w., and s. by a rampart and ditch, whilst on the e. side there is a double embankment of great size, with two ditches of immense width, and in some parts three. It is not quite clear from the description in what degree these latter works are intended respectively for defense or for protection from floods; but the latter must have been the main purpose. The Ain-i-Akbari (c. 1590) alludes to the fact that "if the earthen embankment broke, the town was under water." The position of the city, midway between two rivers of deltaic character, is low, and any rise in those rivers would raise the level of the marshes. Still the mass of these banks, as much as 200 ft. thick at the base, and 40 ft. in height, is greater than any present exposure to flood seems sufficient to explain. It has sometimes been supposed that the Ganges, since the foundation of Gaur, has flowed to the eastward, where is now the bed of the Mahananda. If this were so, the massive character of the embankment would be more intelligible. It would appear, however, that the positive testimony to this circumstance, which was at one time supposed to exist, depended on a mistaken reading of the passage referred to above, of the *Tabaqat-i-Nâsirî*. These great embankments have been originally faced throughout with masonry, whilst the crest shows numerous traces of edifices, but the whole of the earthworks are now overgrown with dense jungle. The Ganges now flows at a distance varying between 5 and 12 m. to the w. of the inclosed area of the city, but there seems to be no doubt that in the earlier centuries of its occupation the great river washed its western wall, where now the Bhagirathi flows. On this side, near the southern end, stood the citadel or royal fortress, stretching for a mile along the river bank, and marked out by the remains of a huge rampart of irregular trace, 180 ft. wide at the base, and faced with masonry, with numerous circular bastions. Shapeless masses of ruin fill the interior. The palace itself forms a rectangular inner inclosure of 2,100 ft. by 750, girt by a splendid brick wall, 18 ft. thick at bottom, $8\frac{1}{2}$ ft. thick at top, and 42 ft. in height. To the northward the western embankment is prolonged far beyond the northern limit of the city, and about 3 m. n. of the latter we encounter a vast line of earthwork stretching from the prolongation just mentioned, in an irregular curve eastward and then south-eastward to the vicinity of the Mahananda river, in all for more than 6 miles. This also was probably intended chiefly as a defense against inundation of the suburbs. A huge excrescence protruding from the line, and overgrown with forest trees, incloses an area of nearly a square mile, which tradition points out as the palace of one of the Sena kings. Still n. of this, and extending to the banks of the Kalindri river, some 3 m. further, are found traces of ancient Hindu buildings. Turning again to the southern extremity of Gaur, for 6 or 7 m. to the s. of the city, there seems to have extended, still under the protection of a western embankment, a continuous chain of suburbs. In the northern portion, at least, of these, "prostrate domes, mingled with carved lintels and innumerable bricks, are seen lying in confusion on all sides, and show how dense has been the population." Thus from n. to s. the whole extent of ground bearing indications of urban occupancy is hardly less than 20 miles. We may, however, feel confident that, as in the case of Delhi, these traces comprehend a space within which the royal city occupied various localities in various ages. Traditions, collected by Dr. Francis Buchanan, placed the residence of the older Sena kings on the site at the extreme n. near the Kalindri. The southern part of the fortified area of Gaur, with the citadel and palace, was evidently, as we shall see from the dates of the buildings, the seat of the later kings who immediately preceded the absorption of Bengal into the Moghul empire in the latter half of the 16th century. The exact site occupied by Mohammed Bakhtiyar Khilji and his successors does not seem to have been determined. Throughout the interior length of Gaur run embanked roads, whilst the whole area is thickly dotted with excavated tanks of all sizes, up to the great Sagar Dighi (or "Ocean Tank"), a rectangular sheet of water measuring little short of a mile by half a mile. This vast work is probably to be referred to the Hindu age. The former existence of six ghauts of masonry can be traced on its banks, which are densely wooded to the water's edge. Numerous excavated channels also run in every direction, the earth from which appears to have served to raise the inhabited surface. The remaining buildings of importance are scattered at wide intervals over

the area, but the soil is throughout covered with fragments of brick, etc., in a manner which leaves no doubt of the former density of population. But Gaur has repeatedly been a quarry of building material. The old Lakhnaoti was robbed to build the mediæval capital of Pandua, and the later Gaur probably to build Rajmahl, whilst in more recent times their brick and stone were transported as merchandize to Malda, Moorshed-abad, Hoogly, Rungpore, and even (as regards the more valuable kinds of stone) to Calcutta. In the revenue returns of Bengal, at the time of its transfer to the Company, there was an entry of an annual levy of 8,000 rupees, "as Gaur brick royalty," from landholders in the neighborhood of Gaur who had the exclusive right of dismantling its remains. The bricks of Gaur, Rennell says, are of extraordinary solidity of texture and sharpness of edge. The facilities which the site affords for water carriage during the rainy season greatly aided this systematic spoliation. That no Hindu buildings remain from the earlier cities is probably to be accounted for by this process of destruction. [*Encyc. Brit.*, 9th ed.]

GAUSSEN, Louis, 1790-1863, was b. in Geneva, and in 1816 became pastor of Satigny, near that city. Here he derived profit from intercourse with pastor Cellerier, who had continued a steadfast Christian in the midst of the declension that was spreading among the Swiss clergy. About this time, through the labors of James and Robert Haldane, of Scotland, genuine religion was greatly revived in Switzerland. But as the work was distasteful to the majority of the Geneva ministers, the *Vénérable Compagnie des Pasteurs* passed ordinances against it which seriously restrained Christian liberty. In opposition to them, Gausсен and Cellerier republished in French the Helvetic confession, with a preface defending the use of confessions of faith. Gausсен labored zealously in Satigny 12 years, and became known throughout Switzerland as a faithful defender of true Christianity, seeking not to divide the church, but to infuse into it new supplies of spiritual life. His activity and his doctrines were equally offensive to the opposite party, and involved him in frequent collisions with the *Vénérable Compagnie*. They ordered him to use the mutilated and rationalistic catechism which had been substituted for Calvin's, and, on his refusal, they censured him. He persevered in his course, and, together with Merle (d'Aubigne) and Galland, formed the "evangelical society" for the circulation of Bibles and tracts. The consistory at last suspended him. In 1834, he became professor of theology in the new evangelical school at Geneva, where he taught a strictly orthodox Christianity, but perhaps without sufficient regard to the peculiarities of modern thought. His *Theopneus* (1840), translated in England and America, maintains, in a form stronger than now commends itself to the majority of evangelical thinkers, the verbal inspiration of the Scriptures. His other writings that have been translated into English are: *Canon of Scripture*; *Geneva and Jerusalem*; *Geneva and Rome*; *It is written*; *Scripture proved to be from God*; *Lessons for the Young on the Six Days of Creation*.

GAUTAMA. See BUDDHISM, *ante*.

GAUTIER, THÉOPHILE, 1811-72; b. at Tarbes, France; educated at the grammar school of that town, and afterwards at the collège Charlemagne in Paris, where it does not appear that he particularly distinguished himself, though in later life his remarkable literary faculty and instinct enabled him to give to much of his work an air of scholarship and almost of erudition. He very early devoted himself to the study of the older French literature, especially that of the 16th and the early part of the 17th centuries. This study qualified him well to take part in the romantic movement, and enabled him to astonish Sainte-Beuve by the phraseology and style of some literary essays which, when barely eighteen years old, he put into the great critic's hand. In consequence of this introduction he at once came under the influence of the great romantic *cénacle*, to which, as to Victor Hugo in particular, he was also introduced by his gifted but ill-starred schoolmate, Gerard de Nerval. With Gerard, Petrus Borel, Corot, and many other less known painters and poets whose personalities he has delightfully sketched in the articles latterly collected under the titles of *Histoire du Romantisme*, etc., he formed a minor romantic clique who were distinguished for a time by the most extravagant eccentricity. A flaming crimson waistcoat and a great mass of waving hair were the outward signs which qualified Gautier for a chief rank among the enthusiastic devotees who attended the rehearsals of Hernani with red tickets marked "Hierro," performed mocking dances round the bust of Racine, and were at all times ready to exchange word or blow with the *perruques* and *grisettes* of the classical party. In Gautier's case, however, whatever they might be in others, these freaks were not inconsistent with real genius and real devotion to sound ideals of literature. He began (like Thackeray, to whom he presents in other ways some striking points of resemblance) as an artist, but soon found that his true powers lay in another direction. His first considerable poem, *Albertus* (1830), displayed a good deal of the extravagant character which accompanied rather than marked the movement, but also gave evidence of uncommon command of language and imagery, and in particular of a descriptive power hardly to be excelled. The promise thus given was more than fulfilled in his subsequent poetry. The *Comédie de la Mort*, which appeared soon after (1832), is one of the most remarkable of French poems, and though never widely read, has received the suffrage of every competent reader. Minor poems of various dates, published in 1840, display an almost unequaled

command over poetical form, an advance even over *Albertus* in vigor, wealth, and appropriateness of diction and abundance of special poetical essence, which is so often absent in the most finished poetical work. All these good gifts reached their climax in the *Émaux et Camées*, first published in 1856, and again, with additions, just before the poet's death in 1872. These poems are in their own way such as cannot be surpassed. Gautier's poetical work contains in little an expression of his literary peculiarities. There are, in addition to the peculiarities of style and diction already noticed, an extraordinary feeling and affection for beauty in art and nature—an indifference nearly absolute to everything beyond this range, and which has doubtless injured the popularity of his work to almost as great a degree as that in which it has increased its special excellence and its charm to those who have a taste for it. But it was not as a poet that Gautier was to achieve either profit or fame. Thrown as he was into circles which were nothing if not literary, it was natural that he should attempt all literary forms, and certain, considering his powers, that he would be successful in all. For the theater, however, he had but little gift, and his dramatic efforts (if we except certain masks or ballets in which his exuberant and graceful fancy came into play) are by far his weakest. For a time he acted as secretary for Balzac, but found his occupation uncongenial enough, though it left some traces in his independent work. His first novel of any size, and in many respects his most remarkable work, was *Mademoiselle de Maupin*. Unfortunately this book, while it established his literary reputation on an imperishable basis, was unfitted by its subject, and in parts by its treatment, for general perusal, and created even in France a prejudice against its author which he was very far from really deserving. During the years from 1833 onward, his fertility in novels and tales was very great. *Le Jeune France*, which may rank as a sort of prose *Albertus* in some ways, displays the follies of the youthful romantics in a vein of humorous and at the same time half-pathetic satire. *Fortunio*, perhaps, belongs to the same class. *Jettatura*, written somewhat later, is less extravagant and more pathetic. A crowd of minor tales display the highest literary qualities, and rank with Merimee's at the head of all contemporary works of the class. First of all must be mentioned the ghost story of *La Morte Amoureuse*, a gem of the most perfect workmanship. For many years Gautier continued to write novels. *La Belle Jenny* is not a very successful attempt to draw on his English experience, but the earlier *Miliona* is a most charming picture of Spanish life. In *Spirite* he endeavored to enlist the fancy of the day for supernatural manifestations, and his *Roman de la Momie* is a learned study of ancient Egyptian ways. His most remarkable effort of this kind, towards the end of his life, was *Le Capitaine Fracasse*, a novel of the school of Dumas, projected nearly 30 years before. This book contains some of the finest instances of his literary power. It was, however, neither in poems nor in novels that the main occupation of Gautier as a literary man consisted. He was early drawn to the lucrative task of feuilleton writing, and for more than 30 years he was among the most expert and successful practitioners of this art. Soon after the publication of *Mademoiselle de Maupin*, in which he had not been too polite to journalism, he became irrevocably a journalist. The rest of his life was spent either in Paris, or in travels of considerable extent to Spain, the Netherlands, Italy, Turkey, England, Algeria, and Russia, all undertaken with a more or less definite purpose of book-making. Having absolutely no political opinions, he had no difficulty in accepting the second empire, and received from it considerable favors, in return for which, however, he in no way prostituted his pen, but remained a literary man pure and simple. Accounts of his travels, criticisms of the theatrical and literary works of the day, obituary notices of his contemporaries, and, above all, art criticisms, occupied him in turn. In the last department he has never had a superior, nor perhaps, except in the cases of Diderot and a great living English critic, an equal. [*Encyc. Brit.*, 9th ed.]

GAUZU-VIVA, a delicately formed deer of Brazil, of a grayish-brown color, with small horns. The animal is very little over 2 ft. in length.

GAVARNI, 1801-66, French caricaturist, b. Paris. His true name was Chevalier (Sulpice Guillaumane), and he is said to have taken the *nom de plume* under which he is known from the place where he made his first published sketch. His parents were poor, and he started in life as a workman in an engine-building factory. At the same time he attended the free school of drawing. Here his natural talent was developed, and he acquired that training of the hand without which an artist is unable to work up his best inspirations. In his first attempt to turn his abilities to some account he met with many disappointments, but was at last intrusted with the drawing of some illustrations for a journal of fashion. Gavarni was at this time 34 years of age. His sharp and witty pencil gave to these generally commonplace and unartistic figures a life-likeness and an expression which soon won for him a name in fashionable circles. Gradually he gave greater attention to this more congenial work, and finally ceased working as an engineer to become the director of the journal *Les Gens du Monde*. His ambition rising in proportion to his success, Gavarni from this time followed the real bent of his inclination, and began a series of lithographed sketches, in which he portrayed the most striking characteristics, foibles, and vices of the various classes of French society. The letter-press explanations attached to his drawings were always short, but were forcible and highly humorous, if sometimes trivial, and were admirably adapted

to the particular subject. The different stages through which Gavarni's talent passed, always elevating and refining itself, are well worth being noted. At first he confined himself to the study of Parisian manners, more especially those of the Parisian youth. He had ceased to be director of *Les Gens du Monde*, but he was engaged as ordinary caricaturist of *Le Charivari*, and, whilst making the fortune of that paper, he made his own. His name was exceedingly popular, and his illustrations for books were eagerly sought for by publishers. *Le Juif Errant*, by Eugene Sue, the French translation of Hoffman's tales, the first collective edition of Balzac's works, *Le Diable à Paris*, *Les Français peints par eux-mêmes*, the collection of physiologies published by Aubert in 38 vols., all owed a great part of their success at the time, and are still sought for, on account of the clever and telling sketches contributed by Gavarni. A single frontispiece or vignette was sometimes enough to secure the sale of a new book. Always desiring to enlarge the field of his observations, Gavarni soon abandoned his once favorite topics. He no longer limited himself to such types as the lorette and the Parisian student, or to the description of the noisy and popular pleasures of the capital, but turned his mirror to the grotesque sides of family life and of humanity at large. *Les Enfants Terribles*; *Les Parents Terribles*; *Les Fourberies des Femmes*; *Politique des Femmes*; *Les Morts Vengés*; *Les Nuances du Sentiment*; *Les Reces*; *Les Petits Jeux de Société*; *Les Petits Malheurs du Bonheur*; *Les Impressions de Menage*; *Les Interjections*; *Les Traductions en Langue Vulgaire*; *Les Propos de Thomas Vireloque*, etc., were composed at this time, and are his most elevated productions. But whilst showing the same power of irony as in his former works, enhanced by a deeper insight into human nature, they generally bear the stamp of a bitter and even sometimes gloomy philosophy. This tendency was still more strengthened by a visit to England in 1849. He returned from London deeply impressed with the scenes of misery and degradation which he had observed among the lower classes of the city. In the midst of the cheerful atmosphere of Paris he had been chiefly struck by the ridiculous aspect of vulgarity and vice, and he had laughed at them. But the debasement of human nature which he saw in London appears to have affected him so forcibly that from that time the cheerful caricaturist never laughed or made others laugh. What he had witnessed there became the almost exclusive subject of his drawings, as powerful, as impressive as ever, but better calculated to be appreciated by cultivated minds than by the public, which had in former years granted him so wide a popularity. Most of these last compositions appeared in the weekly paper *L'Illustration*. In 1857, he published in one volume the series entitled *Masques and Visages*, and in 1869, about two years after his death, his last artistic work, *Les Douze Mois*, was given to the world. Gavarni was much engaged during the last period of his life in scientific pursuits, and this fact must perhaps be connected with the great change which then took place in his manner as an artist. He sent several communications to the *academie des sciences*, and till his death he was eagerly interested in the question of aerial navigation. It is said that he made experiments on a large scale with a view to find the means of directing balloons; but it seems that he was not so successful in this line as his fellow-artist, the caricaturist and photographer Nadar. [*Encyc. Brit.*, 9th ed.]

GAVILAN MOUNTAINS, a group of hills in Monterey co., Cal., near the coast of the Pacific. The highest point is Mt. Pacheco, about 2,850 ft. above the sea.

GAY, DELPHINE. See GINERDIN, EMILE DE, *ante*.

GAY, EBENEZER, 1696-1787, b. Mass.; graduated at Harvard, and settled as a minister in 1718. When he was 85 years old he preached a sermon which has been frequently republished under the name of *The Old Man's Calendar*. His theological views were very liberal.

GAY, MARIE FRANÇOISE SOPHIE, Madame, 1776-1852, daughter of M. Nichault de Lavalette (who was attached to the household of Monsieur, afterwards Louis XVIII.) and of Francesca Peretti, a Florentine lady. Under the guidance of her father, she received a very careful education. In 1793, she was married to M. Liottier, an exchange broker, but was divorced from him in 1799, and shortly afterwards married M. Gay, receiver-general of the department of the Roer or Ruhr. This union brought her into more intimate relations with many distinguished personages whom she had previously known; and her circle of acquaintances gradually extended, until her salon came to be frequented by all the distinguished litterateurs, musicians, actors, and painters of the time, among whom she made herself remarked by her beauty, her vivacity, and her sprightly wit tempered by fine tact and genuine amiability. Her first literary production was a letter written in 1802 to the *Journal de Paris*, in defense of Madame de Stael's novel *Delphine*; and in the same year she published her first novel, *Laure d'Estell*, anonymously. *Leonie de Montbreuse*, which appeared in 1813, is considered by Sainte-Beuve her best work; but *Anatolie*, which appeared in 1815, has perhaps a higher reputation. These and several of her other works, amongst which may be specially named *Les Salons célèbres*, possess interest beyond their intrinsic merit, on account of their purity and elegance of style, for their portrayals of French society especially during the period of the directory and the consulate, and of many of the distinguished personages whose intimacy she enjoyed. Madame Gay wrote several theatrical pieces which won con-

siderable success. She was also an accomplished pianist and harpist, and composed both the words and the music of a number of romances.

GAY, WINCKWORTH ALLAN, b. Mass., 1821; a landscape painter, pupil of prof. Robert Weir at West Point and of Constant Troyon in Paris. His pictures of New England scenery are highly esteemed.

GAYÁ, a district of British India in the Patna division, under the lieutenant-governor of Bengal, situated between 24° 17' and 25° 19' n., and 84° 4' and 86° 5' east. It is bounded on the n. by Patna, on the e. by Monghyr, on the s.e. and s. by Hazaribagh, and on the w. by Shahabad districts. Generally speaking, Gaya consists of a level plain, with a ridge of prettily wooded hills along the southern boundary, whence the country falls with a gentle slope towards the Ganges. Rocky hills occasionally occur, either detached or in groups, the loftiest being Maher hill, about 12 m. s.e. of Gaya town, with an elevation of 1620 ft. above sea-level. The eastern part of the district is highly cultivated; the portions to the n. and w. are less fertile; while in the s. the country is thinly peopled, and consists of hills, the jungles on which are full of wild animals. The principal river is the Son, which marks the boundary between Gaya and Shahabad, navigable by small boats throughout the year, and by crafts of 20 tons burden in the rainy season. The other rivers are the Pimpun, Phalgu, and Jamna, and a number of smaller streams. Two branches of the Son canal system, the eastern main canal and the Patna canal, intersect the district. The census of 1872 takes the area of Gaya district at 4,718 sq.m.; and returns the pop. at 954,129 males and 995,621 females—total, 1,949,750, residing in 6,530 villages or towns, and 327,845 houses. Classified according to religion, there are 1,729,890 Hindus, 219,332 Mohammedans, 203 Christians, and 316 "others." Amongst the higher caste there is an unusually large proportion of Brahmans, a circumstance due to the sacred places which the district contains. The Gaya-wals, or priests in charge of the holy places, are held in high esteem by the pilgrims; but they are not pure Brahmans, and are looked down upon by those who are. They live an idle and dissolute life, but are very wealthy, from contributions extorted from the pilgrims. The ruined city of Buddha Gaya, about 6 m. s. of Gaya town, marks the residence of Sakya Sinha, the founder of the Buddhist religion, who flourished in the 6th c. B.C., and an ancient tree is pointed out as the identical fig tree under which the sage sat in abstraction for five years, until he attained to the state of Buddha. Another place of religious interest is a temple of great antiquity, which crowns the highest peak of the Barabar hills, and at which a religious fair is held each September, attended by from 10,000 to 20,000 pilgrims. At the foot of the hill are numerous rock caves excavated about 200 B.C. [*Encyc. Brit.*, 9th ed.]

GAYARRE, CHARLES E. ARTHUR, b. La. 1805; educated in the college of New Orleans; studied law and was admitted to the bar in 1829. Soon afterwards he published an essay on the history of Louisiana, which attracted much attention. He was a member of legislature, deputy attorney-general, and presiding judge of the New Orleans city court. He was chosen U. S. senator in 1835, but on account of ill-health did not serve. He was twice again elected to the legislature, and was for seven years secretary of state. Among his works are *Histoire de la Louisiane; Romance of the History of Louisiana; Louisiana, its Colonial History and Romance; Louisiana, its History as a French Colony; History of the Spanish Domination in Louisiana; Philip II. of Spain*; and some books of fiction.

GAY-FEATHER, the common name for the *liatris scariosa* and *spicata*: plants which are indigenous to the American soil, possessing bulbous roots, strong taste, and great remedial properties. A familiar local name for them is "rattle-snake master." They bear purple flowers, and are suitable for flower borders.

GEARY, JOHN WHITE, 1819-73; b. Penn.; studied at Jefferson college, and became a civil engineer; served in the war with Mexico, where he was wounded; in 1849 was appointed postmaster at San Francisco; was afterwards alcalde, and military governor, then judge. In 1856, he was appointed governor of Kansas, but was not fortunate in his administration. He raised Union troops on the outbreak of the rebellion, rose to be maj-gen., and obtained command of a division. In 1866, he was chosen governor of Pennsylvania, and re-elected in 1869.

GEAUGA, a co. in n.e. Ohio, on the Cuyahoga and Grand rivers, intersected by the Painesville and Youngstown railroad; 430 sq.m.; pop. 70, 14,190. The surface is undulating, and well adapted to cattle raising. The chief productions are wheat, corn, oats, potatoes, flax, maple sugar, wool, and butter. Co. seat, Chardon.

GEBWEILER (in French, Guebwiller), a t. of the German imperial province of Alsace-Lorraine, in the district of upper Alsace, situated about 13 m. s. of Colmar, at the mouth of the Blumenthal or "Vale of Flowers." It communicates by a branch line with the railway between Strasburg and Basel. Among the principal buildings are the Roman Catholic church of St. Leodgar, dating from the 12th c., the Evangelical church, the synagogue, the town-house, and the old Dominican convent, now used as a market and concert-hall. The spinning, weaving, bleaching, and dyeing of cotton is the chief industry, but woollen goods and silk ribbons, as well as machinery, are also manufactured. Gebweiler is mentioned as early as 774. It belonged to the religious

foundation of Murbach, and in 1759 the abbots chose it for their residence. At the French revolution, 1789, however, the chapter-house was laid in ruins, and though the archives were rescued and removed to Colmar, the library perished in the devastation. Pop. '75, 11,622.

GED, WILLIAM, d. 1749, the inventor of the art of stereotyping, was b. at Edinburgh, about the beginning of the 18th century. In 1725, he first put in practice the art which he had discovered; and some years later he entered into a partnership with a London capitalist, with a view to employing it on a great scale. The partnership, however, turned out ill; and Ged, broken-hearted at his want of success, died in London. The only books which he produced by means of stereotyping were two prayer-books for the university of Cambridge, and an edition of Sallust.

GEDDES, a t. and village in Onondaga co., N. Y., on Onondaga lake, 5 m. n.w. of Syracuse; pop. of township, '75, 5,703; of village, 3,629. The village is noted for salt manufactures (boiling and evaporating the water of the numerous salt-wells), and for manufactures of iron and pottery.

GEDDES, JAMES, 1763-1833; b. Penn., but removed to Onondaga co., N. Y. He was an early and ardent advocate of the Erie canal, one of the first surveyors of the route, and one of the engineers. He occupied the position of county judge, and was largely employed as engineer on canals in New York, Ohio, and Pennsylvania.

GEER, GEORGE JARVIS, D.D., b. Conn., 1821; graduated at Trinity college and the New York general theological seminary; has been deacon, rector, and presbyter, and in 1852 was appointed rector of St. Timothy's church, New York. In 1858, with Dr. Muhlenberg and Dr. Bidell, he published the *Time Book of the Protestant Episcopal Church*, and subsequently *The Conversion of St. Paul*. He was the first president of the Free church Guild of New York, and in 1874 a member of the general convention.

GEESTERMUNDE, a seaport in the Prussian province of Hanover, in the district of Stade, situated at the mouth of the Geeste, a right-hand affluent of the estuary of the Weser. It lies about 32 m. n. of Bremen, and is the terminus of a railway from that city. The interest of the place is purely naval and commercial, its origin dating back no further than 1837, when the construction of the harbor was commenced. The great basin opened in 1863 has a length of 1785 English ft., and a breadth of 410, and a depth of nearly 23, and can accommodate 24 or 25 of the largest ships of the line; and the petroleum basin opened in 1874 has a length of 820 ft. and a breadth of 147. To the left of the basin lies a canal, which has a length of 13,380 ft. and a breadth of 155; and from this canal there strikes off another of similar proportions. The whole port is protected by powerful fortifications, and it lies outside the limit of the German customs. Since 1864, the trade has been almost trebled, the number of vessels being 617 sea-going ships entering in 1875 and upward of 2,000 river craft. Among the industrial establishments of the town are ship-building yards, foundries, engineering works, and steam mills. The population exclusive of the garrison, 3,436 in 1875; and if the neighboring commune of Geestendorf be included, the total was 10,425.

GEEZ. See ETHIOPIA, *ante*.

GEFFRARD, FABRE, son of Nicholas Geffrard, one of the founders of Haytian independence, b. Hayti, 1806. After graduating in 1821, he joined the 13th regiment as a private soldier, attaining the grade of captain in 1843, in which year he joined Hirard, in rebellion against Boyer. Having in 1845 been appointed general of division, he was in 1846 deprived of his command by president Riche, and tried by a court-martial. From 1849 to 1856 he was actively engaged in the army, and distinguished himself in the campaign of 1856, particularly in the retreat from San Juan. Finding that it was the intention of president Soulouque (Faustin I.) to arrest him, he proclaimed himself president, Dec. 21, 1858; drove Soulouque from Port-au-Prince, Jan. 15, 1859, and established himself as president. A rebellion raised by Salnave in 1864-65, was suppressed by president Geffrard. A further revolutionary movement, headed by Salnave, was begun in Feb., 1867, and was sufficiently successful to compel president Geffrard's abdication and flight to Jamaica, where he now resides with his family. He has been for many years extremely popular, and his administration of the government was attended with great success.

GEISSLER'S TUBES, glass tubes used in electrical experiments. They contain some kind of gas in a very rarefied state, which is called an oxygen vacuum, or a nitrogen vacuum, or a carbonic acid vacuum, etc. An electrode is introduced at each end of the tube, so that discharges or currents of electricity, from an induction coil, or from an ordinary statical machine, may be passed through them. The different gases afford different phenomena, according to circumstances. When the glass, which should be hard, is proportioned to the amount of "vacuum," or rarefaction, and also to the current, exquisitely beautiful effects can be produced. A carbonic acid vacuum tube, in the form of a small spiral, is capable of emitting an intense light, and has been proposed as a means of making physical diagnosis, by illuminating certain cavities in the body. They were invented by Heinrich Geissler, a talented practical physicist (Saxony,

1814-79), who was by trade a glass-blower. He afterwards studied physics, and has made several determinations of value in science, as the maximum density of water at 3.8 C., the coefficient of expansion for ice between certain temperatures, and at the freezing-point. He discovered, with Vogelsang, the existence of liquid carbon dioxide in cavities in quartz and topaz. He invented a mercury air-pump, which he used in exhausting his tubes, an areometer, and a vaporimeter. He received the honorary title of PH.D. from the university of Bonn.

GELASIUS I. succeeded Felix III. in 492 as pope, and confirmed the estrangement between the eastern and western churches by insisting on the removal of the name of Acacius, bishop of Constantinople, from the diptychs. He was also the first decidedly to assert the supremacy of the papal over the general councils. He is the author of *De Duabus in Christo Naturis adversus Eutychen et Nestorium*. Five of his letters have also come down to us, and he is most probably the author of *Liber Sacramentorum*, published at Rome in 1680; but the so-called *Decretum Gelasii de Libris Recipiendis et Non Recipiendis* is evidently a forgery. Gelasius died in 496, and was canonized, his day being Nov. 18.

GELASIUS II. (Giovanni da Gaeta), of noble descent, b. at Gaeta about 1050. He received his theological education in the abbey of Monte Casino, and afterwards held the office of chancellor under Urban II., and of cardinal-deacon under Pascal II. On the death of Pascal II., he was elected pope by the cardinals, Jan. 18, 1118, and when his person was seized by Cencius Frangipani, a partisan of the emperor Henry V., he was almost set at liberty, through the general uprising of the people in his behalf. The sudden appearance of the emperor, however, compelled him to leave Rome for Gaeta, and the imperial party chose an anti-pope, Burdinus, archbishop of Braga, under the name of Gregory VIII. Gelasius held a council at Capua, and excommunicated his rival and the emperor. Returning to Rome, under the protection of the Norman princes, he lay concealed for a while, narrowly escaping capture once by the Frangipani, and, after wandering through Italy and France, died at Cluny, 1119.

GELDERN, a t. in Prussia, 17 m. s.w. of Wesel by rail, situated on the river Niers; pop. 5,196. Its business is chiefly the manufacture of woolen cloths, hats, stockings, silk, and linen. It was built in 1097, and was for 250 years the seat of the dukes of Geldern. Frederick the great destroyed the fortifications in 1764.

GELEE, CLAUDE. See CLAUDE LORRAINE, *ante*.

GELSEMIUM, a drug consisting of the root of *gelsemium sempervirens*, a climbing shrub of the natural order *Loganiaceæ*, having a milky juice, opposite, lanceolate, shining leaves, and axillary clusters of from one to five large, funnel-shaped, very fragrant yellow flowers, whose perfume has been compared to that of the wall-flower. The fruit is composed of two separable jointed follicles, containing numerous flat-winged seeds. The stem often runs underground for a considerable distance, and indiscriminately with the root it is used in medicine. The plant is a native of the United States, growing on rich clay soil by the side of streams near the coast, from Virginia to the s. of Florida. In the United States it is commonly known as the wild, yellow, or Carolina jessamine, although in no way related to the true jessamines, which belong to the oleaceæ. It was first described in 1640 by John Parkinson, who grew it in his garden from seed sent by Tradescant from Virginia; at the present time it is but rarely seen, even in botanical gardens, in Great Britain. The medicinal properties of the root were discovered by accident, the infusion having been administered instead of that of some other root, with the result of curing the fever for which it was taken. It was then experimented upon by the American eclectic practitioners. In 1852, prof. W. Proctor called the attention of the medical profession to its valuable properties; and in 1864, it was placed on approval in the secondary list, and in 1873, so rapidly had it risen in favor, in the primary list of remedies of acknowledged value in the United States pharmacopœia. It has latterly attracted considerable attention in England as a remedy for certain forms of facial neuralgia, especially those arising from decayed teeth, or involving branches of the fifth nerve. In the United States it is more particularly valued for controlling nervous irritability in fevers of a malarial type, in which it is said to excel every other known agent. The physiological action of the drug has been carefully examined by Batholow, Ott, and Ringer and Murrell, from whose investigations it appears that it has a paralyzing action on the motor centers, affecting successively the third, fifth, and sixth nerves, its fatal action being due to its causing paralysis of the respiratory muscles, and thus producing death by asphyxia. In large doses it produces alarming symptoms, which occasionally terminate fatally. These appear to vary in different cases, but the more prominent are pain in the forehead and in the eyeballs, giddiness, ptosis, a feeling of lightness in the tongue, slurred pronunciation, labored respiration, wide dilation of the pupils, and impossibility of keeping an erect posture. The mind in most cases remains clear until shortly before death. The earliest and most prominent symptom of a fatal or dangerous dose is the drooping of the eyelids, which indicates the immediate administration of stimulants, for when the paralysis of the tongue which ensues extends to the epiglottis, deglutition becomes impossible, and the epiglottis is apt, unless the sufferer be placed in a forward position, to flap back and close the windpipe. The antidotes

which have been found most successful are carbonate of ammonia, brandy, aromatic spirits of ammonia, and morphia. It has been found that death may be averted by keeping up artificial respiration until the poison is eliminated by the kidneys. [*Encyc. Brit.*, 9th ed.]

GEMS, ARTIFICIAL (*ante*). Artificial gems, properly so-called, are identical in properties and chemical composition with the natural gems. The chemical composition of minerals, including gems, unlike crystallized salts, varies within limits. The production of artificial gems is interesting for two reasons. first, scientifically, from the light thrown upon the conditions under which gems are formed in nature; second, commercially, as foreshadowing the time when they can be made of a size, and at a cost, which will render their manufacture profitable.

Although methods for the artificial production of rubies and sapphires have been known—at least since 1858—the results communicated to the Parisian Academy by MM. E. Frémy and Feil in the latter part of 1877 are far more satisfactory. Rubies and sapphires are colored corundums; therefore, the first problem is the formation of corundums which are composed of alumina (Al_2O_3), and, after that has been solved it is necessary only to incorporate with the corundum mixture the proper metallic oxides to obtain the gems. The theory upon which these experimenters worked was to displace the alumina from its silicate by fusion with a base having a stronger combining power with the silicic acid. The best results were obtained by placing equal parts of porcelain-clay and red-lead in a large crucible, inclosing this in a second, and exposing them for several weeks to an intense red heat in a glass furnace. Two crucibles are necessary, as the lead combines with the silica of the inner one and eats holes through it. Upon allowing the crucibles to cool and breaking the inner one, two strata were found, an upper glassy one, chiefly of silicate of lead, and a lower one containing clusters of corundum crystals. The silicate of lead was removed by melting with oxide of lead or potash. These crystals cut glass, rock crystals, and even topaz, and are exceeded in hardness by only the diamond and crystalline boron. By adding two or three per cent of bichromate of potash, rubies were formed; while sapphires were obtained by using a smaller quantity of bichromate of potash and still less of oxide of cobalt. These gems presented qualities in every respect like the natural ones, while diamond cutters who ground the rubies found them harder; they will probably outwear the natural rubies when used in watches.

At the same meeting at which the memoir of MM. Frémy and Feil was presented, M. Monnier announced that upon cautiously pouring a very dilute solution of oxalic acid upon a solution of silicate of soda as thick as molasses, the silicic acid separated slowly and was deposited, forming opals. By using a solution of nickelous sulphate, apple-green stones such as chrysoprase were formed.

Since 1823 many attempts have been made to produce diamonds by various methods, some of which claim to have been successful. Feb. 26, 1880, Mr. J. B. Hannay, of Glasgow, Scotland, read a preliminary notice before the Royal Society "On the Artificial Formation of the Diamond," and exhibited a number which he had made. In experimenting upon the solubility of solids in vapors immediately beyond the "critical point"—i.e., matter *in transitu* between the liquid and gaseous states—Mr. Hannay found that the solvent power of water was greatly increased, even dissolving to a considerable extent alumina and silica, which are unaffected under ordinary conditions. He further found that upon withdrawal or dilution of the solvent gas, crystalline solids were deposited. These facts suggested the possibility that a solvent might be found for carbon, and diamond crystals be deposited from this solution. After a number of unsuccessful experiments upon the common forms of carbon—charcoal, lampblack, and black-lead—he turned to indirect methods. Remembering that the elements are much more energetic in their action when nascent, or just set free from combination, and having ascertained that upon heating a gas containing hydrogen and carbon, under pressure, in the presence of a metal, the metal attracts the hydrogen and liberates the carbon—it remained only to find a solvent for the nascent carbon, and this he finally found. His method was as follows: In a strong iron tube 20 inches long, 4 inches in diameter, and having a bore of one-half inch, some lithium, and a mixture of highly rectified bone-oil and paraffine-spirit were placed, and the end securely closed with a screw plug. After heating the tube for 14 hours and allowing it to cool, it was opened and, after the gas had passed out, a hard smooth mass was discovered at the upper end of the tube. Upon removing and pulverizing this mass, some hard particles were found which were tested by Profs. Maskelyne, Roscoe, and Dewar, and declared to be diamonds. Mr. Hannay's experiments proved the necessity for the presence of a stable compound containing nitrogen. Thus far it has cost five pounds to produce five shillings' worth of diamond, but further researches will undoubtedly cheapen the process. This is justly considered to be a triumph of chemistry, removing the reproach that, while chemists had built up synthetically many complex organic compounds, they had not produced a diamond composed, as it is, of the single element carbon that underlies the whole. And, among the achievements of the future may be the production of a Koh-i-noor, though, in this case, Nature holds great odds against man, as immense periods of time and great pressures—which are required for the growth of minerals—tax neither her powers nor her patience.

GEMÜNDER, GEORGE, a violin maker, b. Württemberg, 1816. He learned his art of the well known Baptiste Vuillaume of Paris, and coming to the United States, in 1847, established himself at Boston as a musical instrument maker. One secret of the great success he obtained with his violins was the fact that he used wood in its natural condition, rejecting the chemical preparation by which earlier makers had endeavored to impart a certain condition of ripeness to the wood. His violins obtained the first prize at the London international exhibition in 1851, and he met with equal appreciation in Vienna.

GENELLI, Giovanni Buonaventura, 1798-1868; b. Berlin; was the son of Janus Genelli, a painter, whose landscapes are still preserved in the Schloss at Berlin, and grandson to Joseph Genelli, a Roman embroiderer employed to found a school of gobelins by Frederick the Great. Buonaventura Genelli first took lessons from his father and then became a student of the Berlin Academy. After serving his time in the guards he went with a stipend to Rome, where he lived ten years as assistant to Koch, the landscape painter, for whom he conceived a great friendship, and who was a colleague of Hahnel, Reinhard, Overbeck and Fuhrich, all of whom are well known in art. In 1830, he was commissioned by Dr. Hartel to adorn a villa at Leipsic with frescoes, but quarreling with his patron he withdrew to Munich, where he earned a scanty livelihood at first, although he succeeded at last in acquiring repute as an illustrative and figure draughtsman. In 1859, he was appointed professor at Weimar, where he ended his days. Genelli painted few pictures, and it is very rare to find his canvasses in public galleries, but there are six of his compositions in oil in the Schack collection at Munich. These and numerous water-colors, as well as designs for engravings and lithographs, reveal an artist of considerable power whose ideal was the antique, but who was also fascinated by the works of Michel Angelo. Though a German by birth, his style was unlike that of Overbeck or Fuhrich, whose art was reminiscent of the old masters of their own country.

GENERAL CONVENTION OF THE PROTESTANT EPISCOPAL CHURCH.

During the period of colonial dependence the Episcopalians of this country were members of the church of England; under the jurisdiction of the bishop of London. But the war of independence having severed these bonds, it became necessary to obtain episcopal supervision, and to establish an organization under which all the churches of the denomination might unite. To accomplish the latter object clerical and lay delegates from New York, New Jersey, Pennsylvania, Maryland and Delaware assembled at New York in Oct., 1784, and, having agreed on a declaration of fundamental principles, resolved that a convention should be held in Philadelphia the next year. At that place and time delegates were present from Virginia and South Carolina, as well as from the states represented before. At the convention of 1789, Bishop Seabury and delegates from the eastern states took their seats. A constitution was adopted which, in substance, continues in force to the present time. Under it, a general convention of the whole Episcopal church in this country meets once in three years consisting, I., of all the bishops, who form a separate house, and, II., of four clerical and four lay delegates (communicants) from each diocese. The house of bishops has a negative (if declared within three days) on acts passed by the house of deputies; and all acts of the convention must be authenticated by both houses. As originally adopted, the constitution gave the convention power to consent to the formation of new dioceses, to provide the mode of trying accused bishops to establish and revise a book of common prayer, and to regulate various matters connected with the order and efficiency of churches and dioceses. In fact, however, it is said the convention has never restricted itself to the powers originally specified, but has gradually developed into the governing body of the Protestant Episcopal church. Some theologians of that church think that in doing so it has exceeded its lawful powers; others hold that those powers are general and unlimited.

GENERAL OFFICER (*ante*), a term used with much license both in military and civil affairs. By a recent act of the United States congress the office of "general of the army," being the highest rank under the president (who is always commander-in-chief), was created. Besides brigadier and major-general we have lieutenant-general, commissary-general, quarter-master-general, etc. In the militia of the several states there are officers with similar designations and duties. In law we find the attorney-general of the United States, and similar officers in most of the states. The head of the powerful society of the Order of Jesus is known as the general. The French army has generals of division and lieutenant-generals.

GENERAL RULES OF THE METHODIST EPISCOPAL CHURCH, as recognized at the present day, are, with a few slight alterations, the rules drawn up by John Wesley for his first united society. The following are specimens of their design and scope: 1. Each society is divided into classes containing about 12 persons, one of whom is the leader. It is his business—1. To see each of his class at least once a week in order to inquire how their souls prosper; to advise, reprove, comfort, or exhort them; and to receive what they are willing to give towards the support of the gospel. 2. To meet the minister and stewards of the society once a week in order to give the minister all needed information; to pay to the stewards what he has received, and to show his

account of the same. II. The members of the society are expected to give evidence that they continue to desire salvation—1. By doing no harm, and by avoiding evil of every kind, especially those forms most generally practiced. 2. By doing good, being merciful after their power, as they have opportunity; doing good of every possible sort, and, as far as possible, to all men. (Under these first and second divisions appropriate specifications of particulars are made.) 3. By attending on all the ordinances of God, such as public worship, the ministry of the word, the supper of the Lord, family and private prayer, searching the Scriptures, and fasting or abstinence.

GENERAL THEOLOGICAL SEMINARY of the Protestant Episcopal church in the United States. This institution was founded in 1819 at New Haven, Conn., shortly afterwards removed to the city of New York, and chartered by the legislature in 1822. It is governed by a board of trustees, composed of all the bishops of the church *ex-officio*; one trustee from each diocese, and one additional for every eight clergymen in the same; one more additional for every \$2,000 of money contributed, until the same amounts to \$10,000, and then one more additional for every \$10,000. The faculty consists of a dean and such a number of professors as the trustees may from time to time determine. Any person who has been admitted as a candidate for holy orders, with full qualifications, according to the canons of the church, has the right of admission as a student. Others may be admitted on producing satisfactory evidence of moral and religious character, of classical and scientific attainments, of attachment to the church, and in general of such traits and dispositions as indicate a fitness for the ministry. No candidate is admitted without examination in the primary elements of the Hebrew language, in the Greek grammar, and in the Gospels and Acts of the Apostles, in order to test his preparation for entering upon a theological course of study. Candidates are also examined upon the rules and principles of English composition, and required to present a specimen of their proficiency in that department. The course of study extends over a period of three years, and opens on the Wednesday preceding the first autumnal ember day. Students pay nothing for tuition or room-rent within the seminary buildings, but they are expected to furnish their own rooms. Twelve scholarships, of the annual value of \$150, are awarded by the professors, and several prizes are open to annual competition. The seminary occupies two substantial stone buildings, 50 by 110 ft., in 9th avenue and 20th street.

GENESEE, a co. in s.e. central Michigan, on Flint and Shawassee rivers, crossed by the Flint and Pere Marquette and the Detroit and Milwaukee railroads; 648 sq.m.; pop. '74, 34,568. The surface is undulating and well wooded; soil fertile, producing wheat, corn, oats, hay, butter, wool, etc. Lumber is the principal article of export. Co. seat, Flint.

GENESEE, a co. in w. New York, intersected by the New York Central and four or five other railroads, drained by Tonawanda creek; 500 sq.m.; pop. '80, 32,042. The surface is mostly level, and the soil is exceedingly fertile. The main products are wheat, oats, corn, barley, fruit, butter, and cheese. Marl, muck, building-stone, and mineral springs abound. Co. seat, Batavia.

GENESEO, a village in Henry co., Ill., on the Chicago, Rock Island, and Pacific railroad, 159 m. w. by s. of Chicago and 23 m. e. of Rock Island. It is an important grain and stock-shipping point. It contains a national and a private bank, an iron-foundry, agricultural implement, tub and pail, furniture, wagon and carriage, cigar, and other manufactories; and two flour-mills. Besides a flourishing high school, there are several select schools, 3 newspapers, 11 churches, 3 hotels, and a large number of stores, saloons, etc. It is a thrifty, enterprising town. Pop. of v. 3,042.

GENESIS (*ante*)—the first book of the Pentateuch and of the Bible—of which the first words, signifying *In the beginning*, are used in the Hebrew as the title; and of this the Greek translation, *Genesis*, meaning origin or beginning, has been adopted in the Latin and English versions. With this title the whole book is found to correspond, so that it may be called an account of first things or of the beginning of things. It contains, I. *The beginning of the revelation concerning God*. His existence is the first fact announced after the mentioning of the beginning—"In the beginning, God." This, the earliest known written declaration concerning the being of God, was written in the midst of degraded and corrupting polytheism. II. *The account of the beginning of the creation*. 1. At the beginning, the distance of which in the past is not declared, the heavens and the earth were in their substance created. 2. In the narrative, brief as it is, we have recorded (see COSMOGONY) the beginning of motion, of light, of the atmosphere, of the separation of the land from the waters, of vegetable life, of the organized motions of the heavenly bodies, of animal life in the waters, in the air, and on the land, crowned with the beginning of the human race, created male and female, in the image of God, and appointed head over all creatures and all things on the earth. 3. There is also an account of the first dwelling-place provided for man, the paradise or garden of God, which, given, enjoyed, and lost, appears only in this first book, and is spoken of no more in the Bible, except as a reminiscence, until, in the last book, a promise is found that it shall be given again in the new creation to be enjoyed forever. 4. Immediately following the account of the creation of man there is the record of the first marriage, which is declared to be the

model and law for all mankind. 5. And after the account of the finished creation is the record concerning the first Sabbath, a day of rest, instituted, hallowed, and blessed at the beginning, brought—as other books of Scripture show—into remembrance at Sinai, commanded to be observed throughout the history of Israel, made glorious at the beginning of Christianity, and spread abroad among the nations as an earthly rest, emblematic of heaven. III. *The account of the beginning of sin*, which is the substance of all that the Scriptures teach, and the sum of all that men know, concerning the entrance of that fearful and mysterious evil into the world. 2. Following this is the record of the first punishment inflicted which, terrible as it was, appears as the beginning of sorrows that thenceforth came on mankind in consequence of sin, concerning which the Bible has much to say until, in the last book, it promises a world which sin will never enter and in which, consequently, curse, sorrow, pain, and tears will not be known. 3. After the account of the beginning of sin is the record of the first death, of the first crime—the murder of the second born child by the hand of the first—of the growth of depravity until all flesh had corrupted their ways, filling the earth with violence; and, long after that, of the first of the historical series of battles which, beginning after the flood, has been continued to the present hour. IV. *The account of God's plan for checking the power of evil*. 1. By the deluge sweeping away transgressors in the consolidated strength of their iniquity, one family only being saved as the germ of the future race. 2. By preventing the aggregation of the renewed race through the confounding of their speech, so that they were scattered and weakened. 3. By cutting short the duration of life on the earth. At the beginning of the book the record is that men lived for nearly a thousand years; at the close it affirms that a man highly exalted for virtue, piety, and goodness lived only a little more than a century. Moses, the writer of Genesis, wrote also the lamentation concerning the common limit of human life, “the days of our years are threescore years and ten.” At the present time in about half that term of years the chief part of a generation passes away. V. *The beginning of the plan of redemption*. 1. The first promise of a deliverer, “I will put enmity between thee and the woman, and between thy seed and her seed. He shall bruise thy head and thou shalt bruise his heel.” The whole Bible develops this promise and records the fulfillment of it. 2. The first sacrifice, offered up after the entrance of sin, and, as other books of Scripture say, to be continued, multiplied, and completed by Christ offering up himself once for all. 3. The beginning of the history of redemption. The history, beginning with Adam, becomes conspicuous in Abraham and his descendants, constituting a chain of persons in whom the process of redemption was to be advanced, and through whom the promised redeemer was to appear. In the book of Genesis the descent is brought down to the tribe of Judah, and through the following books of the Old Testament it is continued until the New Testament records the coming of the Redeemer.

GENEST, EDMOND CHARLES, 1765–1834; b. near Paris. He was the brother of Marie Antoinette's friend, Madame Campan, but was himself a pronounced republican. In 1789, he was sent on diplomatic service to Russia, but two years later became most unpopular with Catherine II., and in 1792 was formally dismissed. He was appointed ambassador to Holland, but before setting out, he was asked instead to proceed as minister to the United States. Here he endeavored to rouse the people to a participation in the war between France and England, and even fitted out some privateers at Charleston. This, and the general imprudence of his behavior, induced Washington to demand his recall. He was formally recalled as minister, but remained in this country, became a naturalized citizen, and married a daughter of gov. George Clinton of New York.

GENEVA, a co. in s.e. Alabama, on the border of Florida, intersected by the Choctawatchie and Pea rivers; 550 sq.m.; pop. '70, 2,957—227 colored. The surface is level with sandy and unafertile soil. Corn, cotton, and pork are the chief productions. Co. seat, **Geneva**.

GENEVA BIBLE, (BIBLE, *ante*). During the reign of queen Mary, the work of providing an improved English version of the Bible was arrested in England, but received a new impulse among the exiles who fled to Geneva. Their New Testament was printed in 1557, and their whole Bible in 1560. In correct expression of the sense of the Hebrew and Greek originals, this version excelled all that had preceded it; and for 60 years it was in more general use than any other. At least 80 editions (of the whole Bible or of parts) were printed between 1558 and 1611. Among the reasons for its popularity may be mentioned: Its more portable size—small quarto instead of large folio—its use of Roman type instead of the black letter; its adoption of the division into verses; the Bible dictionary which was added to it, and helpful notes. Some of its peculiarities are: It attempts to give the true form of Hebrew proper names; prints words not in the original in italics; gives a calendar of lessons which commemorates Scripture facts and the deaths of reformers, but ignores Saints' days; omits the Apocrypha; in the title to the epistle to the Hebrews, omits Paul's name, and in a note, treats the authorship as an open question.

GENEVA CONVENTION, an agreement concluded at an international conference which was held at Geneva 1864, under the presidency of general Dufour, the Swiss plenipotentiary, for the purpose of ameliorating the condition of the sick and wounded in time of war. The credit of originating this conference must be given to two citizens

of Geneva, Dunant, a physician, who published a startling account of what he had witnessed in two military hospitals on the field of Solferino, and his friend Moynier, chairman of the society of public utility, who took up the idea of "neutralizing the sick wagons," formed associations for its agitation, and at length pressed it upon the governments of Europe, most of which sent representatives to the conference. The convention was drawn up and signed by them on the 22d of August, and since then it has received the adherence of every European power, and one Asiatic (viz., Persia). The convention consists of ten articles, of which the last two are formal. The others provide (1) for the neutrality of ambulances and military hospitals as long as they contain any sick; (2) for that of the staff; (3) that the neutrality of these persons shall continue after occupation of their hospitals by the enemy, so that they may stay or depart, as they choose; (4) that if they depart, they can only take their private property with them except in case of ambulances, which they may remove entire; (5) that a sick soldier in a house shall be counted a protection to it, and entitle its occupants to exemption from the quartering of troops and from part of the war requisitions; (6) that wounded men shall, when cured, be sent back to their own country on condition of not bearing arms during the rest of the war; (7) that hospitals and ambulances shall carry, in addition to the flag of their nation, a distinctive and uniform flag bearing a red cross on a white ground, and that their staff shall wear an arm-badge of the same colors; (8) that the details shall be left to the commanders. A second conference was held at Geneva on the same subject in 1868, and a supplementary convention drawn out, which, though not formally signed, has been acquiesced in by all the signatories of the original convention, except the pope, and which, while still unratified, was adopted provisionally by France and Germany in the war of 1870. It consists partly of interpretations of the former convention, and partly of an application of its principles to maritime wars. Its main provisions are these:—That when a person engaged in an ambulance or hospital occupied by the enemy desires to depart, the commander-in-chief shall fix the time for his departure, and, when he desires to remain, that he be paid his full salary; that account shall be taken in exacting war requisitions not only of the actual lodging of wounded men but of any display of charity towards them; that the rule which permits cured soldiers to return home on condition of not serving again shall not apply to officers, for their knowledge might be useful; that hospital ships, merchantmen having wounded on board, and boats picking up wounded and wrecked men shall be neutral; that they shall carry the red-cross flag, and their men the red-cross armband; the hospital ships, belonging to government shall be painted white with a green strake; those of aid societies white with a red strake; that in naval wars, any strong presumption that the convention is being abused by one of the belligerents shall give the other the right of suspending it towards that power till the contrary is proved, and, if the presumption becomes a certainty, of suspending it to the end of the war.

GENEVIEVE DE BRABANT, b. 680; daughter of a duke of Brabant, sometimes called a saint. About the year 700 she was married to Sigfried, count palatine of Treves. During his absence with Charles Martel against the Saracens she was criminally solicited by Golo, a knight in whose charge her husband had left her. When Sigfried returned, he, finding that his wife had given birth to a child (which in reality was his own), ordered both mother and child to be killed. But their lives were preserved, and many years later, the repentant Sigfried found them out, and acknowledged the injustice of his suspicions. The existing ruins of a chapel built by Genevieve contain an altar on which some of the facts of her history are represented in sculpture.

GENNADIUS. — Georgius Scholari or Scholarius, better known as Gennadius, a learned Greek and for some time patriarch of Constantinople, obtains a place in history through the important part played by him in the contest between Platonism and Aristotelianism which marks the transitions from mediæval to modern thought. Extremely little is known of his life, and so contradictory are some of the accounts bearing on detached facts in it that it has often been supposed that there were two writers of the same name living at the same period. Scholarius first appears in history as assisting at the great council held in 1438 at Ferrara and Florence with the object of bringing about a union between the Greek and Latin churches. At the same council was present the celebrated Platonist, George; Pletho Gemistus, the most powerful opponent of the then dominant Aristotelianism, and consequently the special object of reprobation to Gennadius. In church matters, as in philosophy, the two were opposed—Pletho maintaining strongly the principles of the Greek church, and being unwilling to accept union through compromise, Gennadius, more politic and cautious, pressing the necessity for union, and becoming instrumental in drawing up a form, which from its vagueness and ambiguity, might be accepted by both parties. It would seem that at Florence Pletho published the work on the difference between Aristotle and Plato, which afterwards called forth a reply from Gennadius. Of this reply only the arguments quoted by Pletho in his counter-argument have been preserved. They show that Gennadius, though Aristotelian throughout, had an accurate knowledge of Aristotle, and was more mod-

erate than some of his contemporaries, *e.g.*, George of Trebizond. The next appearance of Gennadius is in 1453. After the capture of Constantinople by the Turks, Mahomet, finding that the patriarchal chair had been vacant for some time, resolved to elect some one to the office. The choice fell on Scholarius, who is described as a layman. While holding the episcopal office, Gennadius drew up, apparently for the use of Mahomet, a symbol or confession of faith, which is very valuable as the earliest expression of the principles of the Greek church. He also at this time had the pleasure of condemning to the flames the great work of his old opponent Pletho, the treatise on *Laws*, of which considerable fragments have come down to us. After a short period of office at Constantinople, Gennadius is said to have resigned the episcopal dignity and to have retired into a convent.

GENOA, a n.w. province of Italy on the gulf of Genoa, 1588 sq.m.; pop. '72, 716,759. It is divided into four districts, forming a strip of coast land around the gulf and embracing the former duchy of Genoa. The rivers rising in the Apennine chain are short in their course. The surface is rough, and agriculture little advanced. Vines and olives, however, abound, and much fruit is exported. Silver, copper, lead, manganese, coal, and slate are found. A railroad parallel with the great highway known as the Cornice road, skirts the coast.

GEN'OA, Thommaso Alberto Vittore, duke of, b. 1854; nephew of Victor Emmanuel and son of the duchess of Genoa. He was educated at Rugby, and in 1870 he came forward as a candidate for the Spanish throne, but at Victor Emmanuel's request he was retired. The duke visited the United States in 1874.

GENOVESI, ANTONIO 1712—69; an Italian writer on philosophy and political economy. At an early age he was destined by his father for the church, and began the study of philosophy and theology. He distinguished himself highly by his acuteness and diligence, and after some struggles, caused by his disinclination for an ecclesiastical life, he took orders at Salerno in 1736. He had not been long in this position when the archbishop of the town, recognizing his rare abilities, nominated him to the chair of rhetoric in the theological seminary. During this period of his life, Genovesi began the study of philosophy as it existed outside the limits of theology. He read with eagerness the works of the chief modern philosophers, and was particularly attracted by Locke. Apparently still dissatisfied with ecclesiastical life, Genovesi, resigning his post at Salerno, proceeded to Rome, undertook the study of law, and qualified as an advocate. The details of legal practice, however, proved as distasteful as theology, and for some years he gave himself up entirely to the study of philosophy, attending most of the distinguished lecturers at the university of Naples. At this place, after having obtained the appointment of extraordinary professor of philosophy, he opened a seminary or private college for students. His reputation as a teacher was increased by the publication in 1743 of the first volume of his *Elements of Metaphysics*, and in 1745 of his *Logic*. Both works are imbued with the spirit and principles of the empirical school of philosophy, and the latter, an eminently practical treatise, had long a recognized position as one of the best logical text-books written from the point of view of Locke. On account of the accusations of infidelity and heresy naturally excited by his discussions of metaphysical principles, he had some difficulty in obtaining the professorship of moral philosophy; and failed in his effort to be appointed to the chair of theology. This, however, did not prevent him from following out his philosophical studies. He published a continuation of his *Elements of Metaphysics*; but with every new volume he experienced fresh opposition from the partizans of scholastic routine. Among these were Cardinal Spinelli, archbishop of Naples, and an abbe Magli, whom Genovesi covered with ridicule in his work entitled *Lettere ad un Amico Provinciale*. In spite of this, Genovesi obtained the approbation of Pope Benedict XIV., of several cardinals, and of most of the learned men of Italy. Among them was Intieri, a Florentine, who founded, at his own expense, in the university of Naples, the first Italian chair of political economy, under three conditions,—namely, that the lectures should be in Italian, that Genovesi should be the first professor, and that, after his death, no ecclesiastic should succeed him.

GENSAN, a port in n. Corea, in the province of Ham-ki-ang, which borders on Russian Amooria. Gensan is situated in the center of a fertile region, just above the 39th parallel of n. latitude, on Broughton's bay, with a good harbor, and possessing considerable trade. The large city of Tokingen lies a few m. to the s., and the port of Katsuma is one league distant. It was opened under the treaty of Feb. 27, 1876, to Japanese trade and residence.

GENTILES, originally any one, not a Jew, equivalent in a religious view to "heathen," as commonly applied. St. Paul calls the Greeks Gentiles. In Solomon's temple, there was "a court of the Gentiles" in the outer space set off by a wall which strangers might not pass. The Mormons of Utah call those Gentiles who are neither Mormons, Jews, nor Indians. The Indians they believe to be the descendants of the last tribes of Israel.

GENTILESCHI, ARTEMISIA and ORAZIO DE, painters. Orazio, 1565-1646, is generally named Orazio Lomi de Gentileschi. It would appear that De Gentileschi was his real surname, Lomi being the surname which his mother had borne during her first marriage. He was born at Pisa, and studied with his half brother Aurelio Lomi, whom in course of time he surpassed. He afterwards went to Rome, and was associated with the landscape painter Agostino Tasi, executing the figures for the landscape backgrounds for this artist in the palazzo Rospigliosi, and it is said in the great hall of the Quirinal palace, although by some authorities the figures in the last-named building are ascribed to Lanfranchi. His best works are "Saints Cecelia and Valerian," in the palazzo Borghese, Rome; "David after the Death of Goliath," in the palazzo Doria, Genoa; and some works in the royal palace, Turin, noticeable for vivid and uncommon coloring. At an advanced age, Gentileschi went to England, at the invitation of Charles I. and was employed in the palace at Greenwich. Vandyck included him in his portraits of a hundred illustrious men. His works are generally strong in shadow and positive in color. He died in England. Artemisia, 1590-1642, Orazio's daughter, studied first under Guido, acquired much renown for portrait-painting, and considerably excelled her father's fame. She was a beautiful and elegant woman; her likeness, limned by her own hand, is to be seen in Hampton Court. Her most celebrated composition is "Judith and Holofernes," in the Pitti palace; certainly a work of singular energy, and giving ample proof of executive faculty, but repulsive and unfeminine in its physical horror. She accompanied her father to England, but did not remain there long. The best picture which she produced for Charles I. was "David with the Head of Goliath." Artemisia refused an offer of marriage from Agostino Tasi, and bestowed her hand on Pier Antonio Schiattesi, continuing, however, to use her own surname. She settled in Naples, whither she returned after her English sojourn. She lived there in no little splendor, and died there. She had a daughter, and perhaps other children.

GENTRY, a co. in n.w. Missouri, on Grand river; 500 sq.m.; pop. '70, 11,607-56 colored. The surface is uneven and partially covered with forests; soil fertile, producing corn, wheat, oats, etc. Co. seat, Albany.

GENTZ, FRIEDRICH VON, 1764-1832; aptly described by Varnhagen von Ense as a writer-statesman. He was more than a publicist or political writer. His position was peculiar, and his career without a parallel. It is believed that no other instance can be adduced of a man exercising the same amount of influence in the conduct of public affairs, without rank or fortune, without high office, without being a member of a popular or legislative assembly, without in fact any ostensible means or instrumentality besides his pen. Born in the middle class in an aristocratic country, he lived on a social equality with princes and ministers, the trusted partaker of their counsels, and the chosen exponent of their policy. His father held an employment in the Prussian civil service; his mother was an Ancillon distantly related to the statesman of that name. On his father's promotion to the mint directorship at Berlin and consequent removal to the capital, he was sent to a gymnasium there, and in due course completed his education at the university of Frankfort-on-the-Oder. He is said to have shown neither liking nor aptitude for intellectual pursuits till after his attendance on the lectures of Kant at Königsberg, in his twentieth, or twenty-first year, when, suddenly lighted up as by inspiration, he set to work in right earnest, mastered the Greek and Latin languages, acquired as perfect a knowledge of French as could well be attained by one who was not a Frenchman, and a sufficient familiarity with English to enable him to translate from it with clearness and fluency. He also managed to gain an intimate acquaintance with English commerce and finance, which he afterward turned to good account. The extent of his acquirements was rendered more remarkable by his confirmed habits of dissipation; for from the commencement to the conclusion of his career he was remarkable for the manner in which, in the midst of the gravest occupations, he indulged his fondness for female society, and a ruinous passion for play. In 1786, he was appointed private secretary to the royal general directory, and was soon afterwards promoted to the rank of war councillor. Like Mackintosh, he was fascinated by the French revolution at its dawn, and, like Mackintosh, was converted to a sounder estimate of its then pending results by Burke. He broke ground in literature in 1794, by a translation of the celebrated *Essay on the French Revolution*, followed in 1794 and 1795 by translations from Mallet du Pan and Mounier. In 1795, he founded and edited a monthly journal which soon came to an untimely end. In Nov., 1797, he published a pamphlet under the title of a *Sendsreiben* or *Missive* addressed to Frederick William III. of Prussia on his accession, pointing out the duties of the new sovereign and especially recommending the complete freedom of the press. In the course of the next three years he contributed to the *Historisches Journal* a series of articles "On the Origin and Character of the War against the French Revolution," with express reference to Great Britain. These led to his visiting England, where he formed intimate acquaintances with Mackintosh, Lord Grenville, Pitt, and other eminent men, which proved lasting, flattering, and remunerative. He was to all intents and purposes a mercenary of the pen, but he was so openly and avowedly, and he was never so much as suspected by those who knew him best of

writing contrary to his convictions at the time. This is why he never lost the esteem and confidence of his employers,—of prince Metternich, for example, who, when he was officially attached to the Austrian government, was kept regularly informed of the sources from which the greater part of his income was derived. Embarrassments of all sorts, ties, and temptations, from which he was irresistibly impelled to tear himself, led to his change of country; and an entry for May, 1802, runs: "On the 15th, I take leave of my wife, and at three in the morning of the 20th, I leave Berlin with Adam Müller, never to see it again." It does not appear that he ever saw his wife again either; and his intimacies with other women, mostly of the highest rank, are puzzling from their multiplicity. He professes himself unable to explain the precise history of his settlement in Vienna. All he remembers is that he was received with signs of jealousy and distrust, and that the emperor, to whom he was presented by count Collorato, showed no desire to secure his services. Many years were to elapse before the formation of the connection with Metternich, the most prominent feature and crowning point of his career. Before entering into any kind of engagement with the Austrian government, he applied to the king of Prussia for a formal discharge, which was granted with an assurance that his majesty, "in reference to his merits as a writer, coincided in the general approbation which he had so honorably acquired." A decisive proof of the confidence placed in him was his being invited by count Haugwitz to the Prussian head-quarters shortly before the battle of Jena, and commissioned to draw up the Prussian manifesto and the king's letter to Napoleon. It was in noticing this letter that Napoleon spoke of the known and avowed writer as "a wretched scribe named Gentz, one of those men without honor who sell themselves for money." In the course of 1806, he published *War between Spain and England*, and *Fragments upon the Balance of Power in Europe*, on receiving which (at Bombay) Mackintosh wrote: "I assent to all you say, sympathize with all you feel, and admire equally your reason and your eloquence throughout your masterly fragment." The bond of union between him and Metternich was formed in 1810. This was one reason, joined to his general reputation, for his being named first secretary to the congress of Vienna in 1814, where, besides his regular duties, he seems to have made himself useful to several of the plenipotentiaries, as he notes in his diary that he received 22,000 florins in the name of Louis XVIII. from Talleyrand, and £600 from lord Castlereagh, accompanied by "*les plus folles promesses*." He acted in the same capacity at the congress or conference of Paris in 1815, of Aix in 1818, Karlsbad and Vienna in 1819, Troppau and Laybach in 1820 and 1821, and Verona in 1822. The following entry in his diary for Dec. 14, 1819, has exposed him to much obloquy as the interested advocate of reactionary doctrines: "About eleven, at prince Metternich's, attended the last and most important sitting of the commission to settle the 13th article of the Bundes-Akt, and had my share in one of the greatest and worthiest results of the transactions of our time. A day more important than that of Leipzig." The 13th article provides that in all the states in the Bund the constitutional government shall be by estates instead of by a representative body in a single chamber; "*in allen Bundesstaaten wird eine landständische Verfassung stattfinden*." Remembering what issued in France from the absorption of the other estates in the Tiers Etat, it would have been strange if Gentz had not supported this 13th article. He was far from a consistent politician, but he was always a sound conservative at heart; and his reputation rests on his foreign policy, especially on the courage, eloquence, and efficiency with which he made head against the Napoleonic system until it was struck down. The most remarkable phase of Gentz's declining years was his passion, in his sixty-seventh year, for Fanny Elssler, the celebrated danseuse, which forms the subject of some very remarkable letters to his attached friend Rahel (wife of Varnhagen von Ense) in 1830 and 1831. He died June 9, 1832. There is no complete edition of his works. The late baron von Prokesch was engaged in preparing one when the Austrian government interfered, and the design was perforce abandoned. [*Encyc. Brit.*, 9th ed.]

GEOLOGY (*ante*). The earth is covered, either wholly or partly, by two envelopes; the first, outer, of gas, surrounding all; the second, inner, of water, covering about three-fourths of the globe; within these is a globe solid and cold on the surface, but in the interior of exceedingly high temperature. The atmosphere reaches to an altitude variously estimated from 40 to 500 m., its density growing more and more attenuated. Its height varies with latitude and by reason of unequal pressure, but it is greatest at the equator and least at the poles. It is believed that the oxygen which now forms half of the surface-matter of the earth was originally a part of the atmosphere, and that the beds of coal forming so considerable a part of the earthy deposit represent the carbonic acid then in the air. So, too, the chlorides in the sea were doubtless carried down from the atmosphere in the condensation of aqueous vapor. It is the opinion of many scientists that the prolific flora of the carboniferous period is evidence of a temperature and moisture much greater than in recent ages. At present, the atmosphere is a mixture of 21 parts, by weight, of oxygen, and 79 of nitrogen, with a very small proportion of carbonic acid, and still smaller quantities of other substances. The minor constituents vary in various places; there is less carbonic acid in the air over the sea; oxygen diminishes and carbonic acid increases in the air of villages and cities.

Although the carbonic acid forms but four one-hundredths of one per ct. of the air, its total amount probably exceeds what would be disengaged if all the animal and vegetable matter on the earth surface should be burned. Vapor of water is the most important of the minute substances in the atmosphere, but its quantity varies, according to temperature, from 4 to 16 grains in 1,000 grains of air. The lower the temperature, the less the capacity for vapor. This vapor, condensed, becomes dew, rain, hail, or snow. Rain brings with it from the atmosphere minute quantities of the chlorides of sodium, potassium, magnesium, and calcium; of the sulphates of soda, potash, lime, and magnesia, and traces of ammonia and various salts; but, in quantity, chloride of sodium is nearly equal to all the others combined. That powerful form of oxygen, ozone, is always present in minute quantities in the air. The organic substances in the air are sometimes living germs, of which some may lead to the propagation of disease. The air of towns is especially impure, particularly where much coal is burned.

Three-quarters of the surface of the earth is water, of greatly varying depth, temperature, and action. From the half-inch ripple along the shelving shore, the sea goes down (as far as sounded) to a depth of more than 5 English miles. Recent investigation shows that the Atlantic has an average depth of from 2 to 3½ miles. It is assumed that the average depth of all seas combined is about 3 m., or say 16,000 feet. The density of sea-water is about 1026, owing to salts held in solution; and it is concluded that the sea-water has always been salt. It is also thought that the composition of the sea, like that of the air, has been subject to gradual change through the geological periods, and that it has reached its present condition after ages of slow transmutation. There is evidence that large quantities of lime, silica, chlorides, and sulphates, have, in the course of time, been removed from the waters of the sea in the secretions of its animal inhabitants. At the same time, the sea has constantly received from the land mineral matters in solution. Every spring, brook, and river, removes salts from the earth, and these salts ultimately find their way to the sea. Therefore, the waters of the ocean contain, in some proportion, every substance that water can dissolve, and probably every element present in the outer shell of the globe. In consequence of these additions, the water of the ocean is gradually growing more and more salt. Inclosed seas, like the Baltic, receiving much water, and having little loss by evaporation, are less salt than the great oceans. If the evaporation be great, the saltness becomes intense, as in the Caspian, and even in the Mediterranean, which holds one-sixth more than the ocean average of saline ingredients. The mineral constituents of the ocean show the following averages:

	Per cent.		Per cent.
Chloride of sodium.....	75.786	Sulphate of magnesia.....	5.597
Chloride of magnesium.....	9.159	Bromide of sodium.....	1.184
Chloride of potassium.....	3.657		100.000
Sulphate of lime (gypsum)..	4.617	Per ct. of salts in sea-water..	3.527

There are also traces of iodine, silica, fluorine, phosphoric acid, carbonate of lime, silver, arsenic, lead, and copper. Sea-water also contains from 2 to 3 per ct. of atmospheric gases. The proportion of oxygen is greater, and that of the carbonic acid least, in the surface-water. It has been calculated that sea-water contains 30 times more carbonic acid than does fresh water.

Enveloped in the atmosphere and the ocean, lies the solid globe. Its density is put at 5½; that is, as a whole, it is 5½ times heavier than a globe of water of the same size. The average density of the surface-matter of the earth is from 2½ to 3, and its mean density is twice that of the outer part. The old theory that the interior of the earth is intensely hot, and all the materials are in fusion, has been much disputed, and, by many, abandoned. Still, the term "crust" is used to denote the outer surface, or such parts as are accessible to observation. Chemical research has discovered 64 simple, or, as yet, indecomposable, bodies or elements, in various proportions and compounds, in the accessible part of the crust. But many of them are of rare occurrence, and the crust is mainly composed of 16, which in the following tables are arranged in groups.

Metalloids.	Atomic Wt.	Metals.	Atomic Wt.
Oxygen.....	15.96	Aluminium.....	27.80
Silicon.....	28.00	Calcium.....	39.90
Carbon.....	11.97	Magnesium.....	23.94
Sulphur.....	31.98	Potassium.....	39.04
Hydrogen.....	1.00	Sodium.....	22.99
Chlorine.....	35.37	Iron.....	55.90
Phosphorus.....	30.96	Manganese.....	54.80
Fluorine.....	19.10	Barium.....	136.80

Oxygen is the most abundant of all these elements, making 21 per cent by weight of the air, nearly 89 per cent of water, and about one-half of all the known rocks on the globe.

Silicon, always united with oxygen, is next in abundance, and silica, alone or in combination with metallic bases, constitutes one-half of the known mass of the globe. Of the metals, aluminium is the most important, and with silicon and oxygen forms the basis of most of the crystalline rocks. Iron is the great source of color, most of the yellow, brown, red, and green hues of the rocks being due to its presence. The 16 elements named in the foregoing list make up 99 per cent of the earth's crust; the other one-hundredth part embraces the gold, silver, copper, etc.; indeed all the metals except iron. So far as we know, the outer portion of our planet consists mainly of metalloids, and its metallic constituents have in great part entered into combination with oxygen, so that the atmosphere contains the residue of that gas which has not united itself in mineral compounds.

As for the interior or nucleus of the globe, we must reason about its construction from what we know of the crust, of the irregular distribution of materials, and the distribution of land and water. That the southern hemisphere is nearly covered with water seems to show an excess of density in that section of the globe. Evidently the central mass of the earth must be very dense; since the average density of which is much greater than that of the crust, and this greater density would be a natural, if not a necessary, result of the pressure of the superincumbent crust upon the central mass. That there is in many places, perhaps everywhere, a high degree of temperature in or under the crust of the earth, is manifested by so many proofs that it cannot be doubted. Nature shows it in extinct and active volcanoes, and thousands upon thousands of springs of hot water. Man has discovered the same fact in digging mines and boring wells. Winter's cold and summer's heat may be regarded as following each other in successive downward waves which disappear at a limit where the temperature remains constant. This zone of constant temperature is believed to lie between 60 and 80 ft. below the surface of the earth in the temperate regions; but near the city of Yakutsk, in Siberia, 62° n., the ground is constantly frozen to a depth of 700 ft.; in the island of Java, a constant temperature is found at a depth of 2 or 3 feet. Below the limit of the influence of ordinary seasonable changes, the temperature is nowhere found to diminish downwards. There are exceptional cases, but they are all explainable. Near hot springs or volcanoes special agencies of lava, etc., may produce an abnormal subterranean temperature, and thousands of years may pass before the restoration of thermal equilibrium. Again, masses of ice and snow over the surface for thousands of years would so depress the temperature that it would require ages to recover. But beneath the limit to which the influence of the seasons extend, observations in most parts of the globe show that the temperature invariably rises as we go towards the interior of the earth. This increase is estimated to be one degree Fahrenheit for every 50 or 60 ft. of depth. Experiments, however, show remarkable deviations, between 83 ft. in the coal measures near Manchester, Eng., to 41 ft. in coal measures near Glasgow. In the famous artesian well at Grenelle, near Paris, 1800 ft. deep, the increase is a degree for 57 ft.; the same is found in the well at Mendorf, near Luxembourg, 2,400 ft. deep. But there are variations in the increment of downward heat due to the varying conductivity of rocks at or near the surface. For instance, the resistance of opaque white quartz is expressed by 114; that of basalt by 273; and that of cannel coal at 1538, or 13 times more than that of quartz.

Many theories have been propounded concerning the condition of the interior of the earth, but prof. Geikie considers only three of them worthy of serious consideration. The first supposes the globe to consist of a solid crust and a molten interior. The second holds that, with the exception of local vesicular spaces, the globe is solid to the center. The third contends that while the mass of the globe is solid, there lies a liquid substratum near the crust. In favor of the first theory, the arguments are: The ascertained rise of temperature, which at a depth of 50 m. would become $4,600^{\circ}$ Fahrenheit—more than enough to melt platinum, the least fusible of metals; the existence of volcanoes throwing out molten rocks, and presumably fed from the great interior fire; the fact that the products of volcanoes, no matter how widely separated, show almost complete uniformity in character; the earthquakes, which are inexplicable except upon the supposition of a thin and flexible crust. Of course all these arguments are *a posteriori*, or inferential; but they have been strongly urged by geologists as the only views compatible with geological evidence. The arguments against the internal fluidity of the earth are based upon physical and astronomical considerations. First, the argument from the precession of the equinoxes, and nutation. In 1839, Mr. Hopkins of Cambridge endeavored to calculate how far the planetary motions of nutation and precession would be influenced by the solidity or liquidity of the earth's interior. His conclusions indicate that these movements could not be as they are if the globe consisted of a central ocean of molten matter, surrounded with a crust 20 or 30 m. thick; that the least thickness consistent with the actual movements must be from 800 to 1000 m., and that the whole might be solid to the center with the exception of comparatively small vesicular spaces filled with melted rock. The assumption of a comparatively thin crust requires that the crust shall have such perfect rigidity as is possessed by no known substance. The tide-producing force of the sun and the moon exerts such a strain upon the substance of the globe, that it seems impossible that the planet could maintain its shape unless the supposed crust were at least 2,000 or 2,500 m. in thickness. The conclusion

is reached that the mass of the earth is on the whole more rigid than a continuous solid globe of glass of the same diameter. The second argument is from the tides, which are explicable only on the theory that the earth is solid to the center or has a crust deep enough to make it practically so, that is 2,500 m. or more. The third argument is based on the relative densities of melted and solid rock. The earth's central mass may be supposed to be metallic, or of some substance equally heavy. Into this dense mass the comparatively light crust could not sink, though its earliest formed portions would no doubt descend until they reached a stratum whose specific gravity agreed with their own.

The Age of the Earth is discussed from geological and physical standpoints. Taking the geological view we must remember that we do not know that changes going on now were going on in the same way millions of years ago; the conditions might have been different, and the changes vastly more rapid; but assuming stratified deposits to have been going on at the present rate for an indefinite period, one writer puts down 60,000,000 of years as the least probable age of the globe. In the stratified rocks we have abundant proof that the whole fauna and flora of the earth's surface have passed through many revolutions, species, genera, and families have appeared and vanished many times in succession. On any supposition it must be admitted that these vicissitudes in the organic world can have been effected only during vast periods of time, though no trustworthy standards seem to be available whereby these periods are to be measured. The argument, from geological evidence, favors an interval of probably one hundred millions of years since the advent upon the earth of the earliest form of life and the beginning of the deposition of the oldest stratified rocks. The argument as to the age of the earth, based upon physics, assumes, first, the internal heat and rate of cooling of the globe; second, the tidal retardation of the earth's rotation; third, the origin and age of the sun's heat. With regard to internal heat Sir William Thompson concluded that the superficial consolidation of the globe could not have occurred less than 20,000,000 nor more than 400,000,000 years ago. The argument from tidal retardation proceeds on the admitted fact that, the rotation of the earth is retarded by the friction of the tide wave, and is therefore much slower than it was ages ago. The argument based on the sun's heat is hardly to be depended upon; the time during which the sun has lighted the earth has been estimated at fifteen millions, and at a hundred millions of years. The latter estimate is amply sufficient for all the purposes of geology.

DYNAMICAL GEOLOGY discusses the processes now in action upon the earth, whereby changes are made in the structure and composition of the crust; in the relations between the interior and the surface, as shown by volcanoes, earthquakes, and other terrestrial disturbances; in the distribution of oceans and continents; in the outlines of the land, and the form and depth of the sea-bottom; in climate; and in the races of plants and animals by which the earth is tenanted. It brings before us all the activities which it is the province of geology to study. The range of operations included within the space of inquiry in this branch of the science may be regarded as a vast cycle of change, into which we may break at any point and around which we may travel, only to find ourselves brought back to the starting point. Before any of the periods of which a record remains in the visible rocks, the chief source of geological action probably lay within the earth itself. The planet still retained much of its initial heat, and was doubtless the theater of great chemical changes, giving rise, perhaps, to manifestations of volcanic energy like those which have so marvelously roughened the surface of the moon. As the outer layers of the globe cooled, and the disturbances due to internal heat and chemical action became less marked, the influence of the sun, which must have always operated, would be relatively more efficient, causing a wide circle of superficial changes wherein variations of temperature and the circulation of air and water over the earth come into play.

While inquiring into the history and the present condition of the earth the geologist must keep his mind open to the reception of evidence for kinds and degrees of action which he has not imagined. Human experience has been too short to allow the assumption that the causes and modes of geological changes have been definitely ascertained. Future discovery may produce evidence of former operations by heat, magnetism, chemical change, or otherwise, which may explain many of the phenomena with which geology has to deal. Of the influences, so many and so profound, which the sun exerts upon our planet, we can as yet perceive but little; nor can we tell what other cosmical influences may have given their aid in the evolution of geological changes. In the present state of our knowledge all the geological energy upon and within the earth must be traced back to the parent sun. There is, however, propriety and convenience in distinguishing that part of it which is due to the survival of some of the original energy of the planet, and that part which rises from the present supply of energy received day by day from the sun. In the former case we have to deal with the interior of the earth and its reaction upon the surface; in the latter we deal with the surface of the earth, and to some extent with its reaction on the interior. This distinction affords an opportunity to treat the subject under two divisions:

I. *Hypogæic, or Plutonic Action*; the changes within the earth caused by original internal heat and by chemical action.

II. *Epigæic, or Surface Action*; the changes produced on the superficial parts of the earth, chiefly by the circulation of air and water set in motion by the sun's heat.

In considering hypogene action we must call to mind a globe still intensely hot in its interior, radiating heat into space, and contracting in bulk. Molten rocks from the interior are from time to time poured out upon the surface; wide areas are raised up or sunk down; and in these movements remarkable changes are produced upon the rocks of the crust; they are broken, rendered crystalline, and sometimes fused. (See VOLCANOES.)

In the case of *Earthquakes*, the earth-wave or wave of a shock underneath a country may traverse a wide region and affect it violently at the time without leaving any trace of its passage. Loose objects, however, are apt to be displaced. Thus blocks of rocks already disengaged from their parent masses may be rolled into valleys. Landslides may be produced, making changes in the courses of streams. Fissures are made in the soil, from the size of tiny crevices to wide chasms. Trees may be thrown down and buried, and the surface of the region may be radically changed. But in a few years these superficial effects may be effaced by the leveling power of the atmosphere. In New Zealand, in 1848, an earthquake fissure 18 inches wide was traced for 60 m., and in 1855 another was made of 90 m. in length. Remarkable circular cavities are sometimes formed in the ground during the passage of the earth-wave. In many cases these holes serve as funnels for the escape of water. They are believed to be caused by the collapse of subterranean water-channels and the consequent forcible ejection of water to the surface. Springs are affected by earthquake movements, becoming more or less in volume, discolored, or muddy, and increasing or diminishing in temperature; and brooks and rivers are accelerated or stopped. Lakes rise or fall at great distances from the center of disturbance. When the earthquake occurred at Lisbon many of the lakes in central and north-western Europe were so affected as to maintain a succession of waves two or three feet above their usual level.

In some cases lakes have become dry ground, and dry ground lakes. The great sea-wave propagated outward from the center of a sub-oceanic earthquake, and reaching the land after the earth-wave has arrived there, gives rise to much destruction along the maritime parts of the disturbed region. As it approaches the shore, the littoral waters retreat seaward, sucked up, as it were, by the advancing wall of water, which, reaching a height of sometimes 60 ft., rushes over the bare beach and sweeps inland, carrying with it everything which it can dislodge and bear away. Loose blocks of rock are thus lifted to a considerable distance from their former position, and left at a higher level. Deposits of sand, gravel, and other superficial accumulations are torn up and swept away, while the surface of the country, as far as the limit reached by the wave, is strewn with débris. If the district has been already shattered by the passage of the earth-wave, the advent of the great sea-wave augments and completes the devastation. It has been observed, after the passage of an earthquake, that the level of the disturbed country has been changed. Thus after the terrible earthquake of Nov. 19, 1822, the coast of Chili for a long distance was found to have risen from 3 to 4 ft., so that along the shore the littoral shells were exposed, adhering still to the rocks, amid multitudes of dead fish. The same coast-line has since been further upraised by subsequent earthquake shocks. On the other hand, many instances have been observed where the effect of the earthquake has been to depress permanently the disturbed ground. For example, during the Bengal earthquake of 1762, an area of 60 m. on the coast, near Chittagong, suddenly went down beneath the sea, leaving only the tops of the higher eminences above water. The succession of earthquakes, which in the years 1811 and 1812 devastated the basin of the Mississippi, produced wide depressions of the ground, over some of which the river spread so as to form new lakes, with the tops of the trees still standing above the surface of the water.

An earthquake shock has been defined by Mr. Mallet as the transit of a wave of elastic compression through the crust and surface of the earth, generated by some sudden impulse within the crust. The passage of such a wave has been imitated experimentally, and some of its characteristic features have been illustrated by accidental explosions at powder-works. But though the phenomena point to some sudden and violent blow inflicted upon the crust, it is impossible to do more than speculate on the probable nature of this blow. In some cases it may arise from the sudden flashing into steam of water in the spheroidal state; from the sudden condensation of steam; from the explosion of a volcanic orifice; from the falling in of the roof of a subterranean cavity; or from the sudden snap of subterranean rocks subjected to prolonged and intense strain. But we are still in ignorance as to the actual immediate cause of any earthquake in regions remote from active volcanoes. This, at least, is certain, that the shock must arise from some sudden and violent impulse, whereby a wave or undulation is propagated in all directions through the solid substance of the crust.

Besides the sudden movements due to earth-shocks, the crust of the earth undergoes, in many places, *oscillations* of an extremely quiet and uniform character, sometimes of an elevatory, sometimes of a subsiding nature. So tranquil are these changes that they produce from day to day no appreciable alteration in the aspect of the ground affected. Only after the lapse of several generations, and by careful measurements, can they be proved. Indeed, in the interior of a country nothing but a series of accurate levelings from some unchanged datum-line might detect the change of level, unless the effects of this terrestrial movement showed themselves in altering the drainage. It is only along

the sea-coast that a ready measure is afforded of any such movement. In popular language it is usual to speak of the sea as rising or sinking relatively to the land. But so long as the volume of the ocean remains the same, the general sea-level can neither rise nor fall, unless by some movement of the solid globe underneath it. And, as we cannot conceive of any possible augmentation of the oceanic waters, nor of any diminution, save what may be due to the extremely slow process of abstraction by the hydration of minerals, or absorption into the earth's interior, we are compelled to regard the sea-level as furnishing a practically constant datum-surface, any deviation from which, in the apparent heights of sea and land, must be due to movement of the land and not of the sea. There are, indeed, certain cosmical causes which may affect the relative levels of sea and land. Thus the accumulation of immense masses of snow and ice as an ice-cap at one of the poles would tend to displace the earth's center of gravity, and as a consequence, to raise the level of the ocean in the hemisphere so affected, and to diminish it in a corresponding measure elsewhere. The return of the ice into the state of water would produce the opposite effect. Dr. Croll has also drawn attention to the fact that, as a consequence of the diminution of the centrifugal force, owing to the retardation of the earth's rotation caused by the tidal wave, the sea-level must have a tendency to subside at the equator and rise at the poles. A larger amount of land need not ultimately be laid bare at the equator, for the change of level resulting from this cause would be so slow that the general degradation of the surface of the land might keep pace with it, and diminish the terrestrial area as much as the retreat of the ocean tended to increase it. Dr. Croll has further pointed out that the waste of the equatorial land, and the deposition of the detritus in higher latitudes, must still further counteract the effects of retardation and the consequent change of ocean-level. Such widespread general causes of change must produce equally far-reaching effects. But in examining the changes of level between land and sea, we find them to be eminently local and variable in character, pointing to some local and unequally acting cause—so that, while admitting these cosmical and widespread influences to be part of the general system of geological change, we must yet hold the sea-level, for all practical purposes, to be inviolable, any apparent oscillations of that level upon the land being due to terrestrial movements.

Various maritime tracts of the land have been ascertained to have undergone in recent times, or to be still undergoing, a gradual elevation above the sea. Thus the coast of Siberia for 600 m. to the e. of the river Lena, the western tracts of South America, and the Scandinavian peninsula, with the exception of a small area at its southern apex, have been proved to have been recently upheaved. The proofs of this change of level chiefly to be relied on are the following: (1) The position of rocks covered with barnacles or other littoral adherent animals, or pierced by lithodromous shells. A single stone with these animals on its surface would not necessarily prove anything, for it might be cast up by a storm; but a line of large boulders, which had evidently not been moved since the cirripedes and mollusks lived upon them, and still more a solid cliff with these marks of littoral or sub-littoral life upon its base, now raised above high-water mark, would be sufficient to demonstrate a rise of land. The amount of the upheaval might be determined with sufficient accuracy by measuring the vertical distance between the upper edge of the barnacle zone upon the upraised rock, and the limit of the same zone on the present shore. (2) A line of sea-caves, now standing at a distance above high-water mark beyond the reach of the sea, would afford evidences of recent uprise, since caves of this kind are hollowed out only by the waves between tide-marks. (3) One of the most striking proofs of upheaval is furnished by what are termed "raised beaches." A beach is the space between tide-marks, where the sea is constantly busy depositing sand and gravel, mingled with the remains of shells and other organisms, sometimes piling the deposits up, sometimes sweeping them away into the more open water. The terrace or platform thus formed is a well-marked feature of coast-line skirting tidal seas. When the land rises with sufficient rapidity to carry the line of littoral deposits above the reach of the waves, the flat terrace thus elevated is known as a raised beach. The former high-water mark then lies inland, and while its sea-worn caves are in time hung with ferns and mosses, it furnishes itself an admirable platform, on which meadows, fields, and gardens, roads, houses, villages, and towns spring up, while a new beach is made below the uplifted one. Raised beaches abound along many parts of the coast-line of Britain. Some excellent examples occur in Cornwall and Devon. The coast-line on both sides of Scotland is fringed with raised beaches, sometimes four or five occurring in succession at heights of 25, 40, 60, 75, and 100 ft. above the present high-water mark. Such beaches can be traced also in the valley of the Connecticut river in western Massachusetts. Each terrace marks a former lower level of the land with regard to the sea, and probably a lengthened stay of the land at that level, while the differences of level indicate the vertical amount of each successive uplift of the land, and show that the land in its upward movement did not remain long enough at intermediate points for the formation of terraces. A succession of raised beaches, rising above the present sea-level, may therefore be taken as pointing to a former prolonged upheaval of the country, interrupted by long pauses, during which the general level did not materially change. (4) Any stratum of rock containing marine organisms, which have manifestly lived and died where their remains now

lie, must be held to prove upheaval of the land. In this way it can be shown that most of the solid land now visible to us has once been under the sea. Even high on the peaks of the cliffs and the flanks of the Himalaya mountains, undoubted marine shells occur in the solid rocks. (5) In countries which have been long settled by a human population, it is sometimes possible to prove, or at least to render probable, the fact of recent uprise of the land by reference to tradition, to local names, and to works of human construction. Piers and harbors, if now found to stand above the upper limit of high water, furnish indisputable evidence of a rise of land since their erection.

It is more difficult to trace the downward movement of the land, for the evidence of each successive sea-margin is carried down, and washed away or covered up. Nevertheless, the fact of subsidence can be satisfactorily established by the following kinds of proofs: (1) The results of mere erosion by the sea and those of actual depression of the level of the land cannot always be distinguished without some care. The encroachment of the sea upon the land, involving, it may be, the disappearance of successive fields, roads, houses, villages, and even whole parishes, does not necessarily indicate a sinking of the land. Such destruction of the coast-line may, indeed, be in progress without any actual change of level. Should the sea, however, rise to the level of roads and buildings which it never used to touch; should former half-tide rocks cease to show even at low-water, and should rocks, previously above the reach of the highest tide, be turned first into shore-reefs, then into hummocks and islets, we infer that the coast-line is sinking. Such kind of evidence is found in Scania, the most southerly part of Sweden. Streets, built of course above high-water mark, now lie below it, with older streets lying lower than they, so that the subsidence is of some antiquity. A stone, the position of which had been exactly determined by Linnaeus in 1749, was found after 87 years to be 100 ft. nearer the water's edge. The w. coast of Greenland, for a space of more than 600 m., is perceptibly sinking. It has there been noticed that over ancient buildings on low shores, as well as over entire islets, the sea has risen. The Moravian settlers have been more than once driven to shift their boat-poles inland, some of the old poles remaining visible under water. (2) As the land is brought down within reach of the waves, its characteristic surface-features are apt to be effaced, so that the submerged area, which passes down beneath the sea, may retain little or no evidence of its having been a land-surface. It will be covered, as a rule, with sea-worn sand or silt. Hence, no doubt, the reason why, among the marine strata which form so large a part of the stratified portion of the earth's crust, and where there are many proofs of depression, actual traces of land-surfaces are comparatively rare. It is only under very favorable circumstances, as, for instance, where the area is sheltered from prevalent winds and waves, and where, therefore, the surface of the land can sink tranquilly under the sea, that fragments of that surface may be completely preserved under overlying marine accumulations. It is in such places that "submerged forests" occur. These are stumps or roots of trees still in their positions of growth in their native soil. Beds of peat, full of tree stumps, hazel-nuts, branches, leaves, and other indications of a terrestrial surface, are often found in similar situations. Sir Henry de la Beche has described, around the shores of Devon, Cornwall, and western Somerset, a vegetable accumulation, consisting of plants of the same species as those which now grow freely on the adjoining land, and occurring as a bed at the mouths of valleys, at the bottoms of sheltered bays, and in front of and under low tracts of land, the seaward side of which dips beneath the present level of the sea. Over this submerged land-surface sand and silt containing estuarine shells have generally been deposited, whence we may infer that in the submergence the valleys first became estuaries, and then sea-bays. If now, in the course of ages, a series of such submerged forests should be formed one over the other, and if, finally, they should, by upheaval of the sea-bottom, be once more laid dry, so as to be capable of examination by boring, well-sinking, or otherwise, they would prove a former long-continued depression, with intervals of rest. In such a case, the intervals of pause would be marked by the buried forests, and the progress of the depression by the strata of sand and mud lying between them. In short, as to a former protracted elevation followed by a long pause, the evidence would be strictly on a parallel with that furnished by a succession of raised beaches. 3. An interesting kind of proof of an extensive depression of the north-west of Europe is furnished by the deep fjords or sea-lochs by which that region is indented. A fjord is a long, narrow, and often singularly deep inlet of the sea, which terminates inland at the mouth of a glen or valley. The word is Norwegian, and in Norway fjords are characteristically developed. The English word "firth," however, is the same, and the western coast of the British isles furnish many excellent examples of fjords. In Scotland they are usually called lochs, as loch Houra, loch Nevis, loch Fyne, Gareloch; in Ireland they are sometimes known by the name of loughs, as lough Foyle, but more commonly by that of bays, as Dingle bay, Bantry bay. There can be little doubt that, though now filled with salt water, fjords have been originally land valleys. The long inlet was first excavated as a land valley or glen. This valley exactly corresponds in form and character with the hollow of the fjord, and must be regarded as merely its inland prolongation. That the glens have been excavated by sub-aërial agents is a conclusion borne out by a great weight of evidence. If, therefore, we admit the sub-aërial origin of the glen, we must also grant a similar origin to its sea-

ward prolongation. Every fjord will thus mark the site of a submerged valley. This inference is confirmed by the fact that fjords do not, as a rule, occur singly. Like the glens of the land, they lie in groups; so that when they are found intersecting a long line of coast like that of the w. of Norway, or the w. of Scotland, we conclude that the land has there sunk down so as to permit the sea to run far up and fill the submerged glens. 4. Evidence of widespread depression over the area of the Pacific ocean is furnished by the numerous atolls, or coral islands, scattered through that vast expanse of water. Mr. Darwin ascertained that the reef-building corals do not live at a greater depth than about 15 or 20 fathoms. Yet reefs and circular islets of coral rise with nearly perpendicular sides from a depth of 2,000 ft. and upwards, until they reach the surface of the sea. As the corals could not have begun to grow upwards from such vast depths, Mr. Darwin first suggested that the sites of these coral reefs had undergone a progressive subsidence, the rate of upward growth of the reefs keeping pace, on the whole, with the depression. A fringing reef would first be formed fronting the land within the limit of the 20-fathom line. Growing upward until it reached the surface of the water, it would be exposed to the dash of the waves, which would break off pieces of the coral and heap them upon the reef. In this way islets would be formed which, by successive accumulations of materials thrown up by the breakers, or brought by the winds, would remain permanently above water. On these islets palms and other plants, whose seeds might be drifted from the adjoining land, would take root and flourish. Inside the reef there would be a shallow channel of water, communicating through gaps in the reef, with the main ocean outside. Fringing reefs of this character are of common occurrence at the present time. In the case of a continent they front its coast for a long distance, but they may entirely surround an island. If the site of a fringing reef undergoes depression at a rate sufficiently slow to allow the corals to keep pace with it, the reef will grow upward as the bottom sinks downward. The lagoon channel inside will become deeper and wider, while, at the same time, the depth of the water outside will increase. In this way a barrier reef will be formed. Continued slow depression must continually diminish the area of the land inclosed within one of these rings of coral reef, while the reef itself retains much the same size and position. At last the final peak of the original island disappears under the lagoon, and an atoll, or true coral island, is formed. Should any more rapid or sudden downward movement take place, it might carry the atoll down beneath the surface, as seems to have happened at the Great Chagos bank in the Indian ocean, which is a submerged atoll. It has recently been suggested that barrier reefs do not necessarily prove subsidence, seeing that they may grow outward from the land, upon a talus of their own débris broken down by the waves, and may thus appear to consist of solid coral, which had grown upward from the bottom during depression, although only the upper layer, 20 fathoms or thereabouts in thickness, is composed of solid, unbroken, coral growth. The explanation may doubtless account for some barrier-reefs, and for the way in which the steep seaward face of all such reefs is formed and maintained. But it does not elucidate the existence of submerged atolls, the presence of gaps in atolls answering to gaps in the fringing reefs opposite to the mouths of rivers; and the difficulty of supposing that, in a coral archipelago, there should have been scores of submerged peaks so nearly of the same height as to rise within 20 fathoms of the surface, and yet so seldom actually to tower above it. According to the simple and luminous theory of Mr. Darwin, every stage in the progress of the changes is open to observation, from the incipient fringing reef to the completed and submerged atoll. Every observed fact fits in harmoniously with the others, and we reach the impressive conclusion that a vast area of the Pacific ocean, fully 6,000 geographical miles from e. to w., has undergone a recent subsidence, and may be slowly sinking still. It by no means follows, however, as some writers have imagined, that the present Pacific ocean occupies the site of a vast submerged continent. All the coral islands seem to have been built on volcanic peaks. Wherever any non-calcareous rock appears it is of volcanic origin. We must therefore conceive of these oceanic islands as detached volcanic eminences rising out of a wide area of subsidence, and doubtless as deriving their existence from the results of that subterranean movement.

These movements, without question, we must again trace back to consequences of the original heat of the earth. There are various ways in which the heat may have acted. Thus a considerable accession of heat expands rocks; and, on the other hand, a loss of heat causes them to contract. We may suppose, therefore, that, during the subterranean changes, a great extent of the crust underneath a tract of land may have its temperature slowly raised. The effect of this increment would be to cause a slow uprise of the ground above. The gradual transference of the heat to another quarter might produce a steady subsidence. Such variations in subterranean temperature, however, could give rise at the most to very insignificant elevations or depressions. A far more important and generally effective cause is to be sought in the secular contraction of the globe. If our planet has been steadily losing heat by radiation into space, it must have progressively diminished in volume. The cooling implies contraction. According to Mr. Mallet, the diameter of the earth is less by at least 189 m. since the time when the planet was a mass of liquid. But the contraction has not manifested itself uniformly over the whole surface of the planet. The crust varies much in structure, in thermal resistance, and in the position of its isogeo-thermal lines. As the hotter

nucleus contracts more rapidly by cooling than the cooled and hardened crust, the latter must sink down by its own weight, and in so doing must accommodate itself to a continually diminishing diameter. The descent of the crust gives rise to enormous tangential pressures. The rocks are crushed, crumpled, and broken in many places. Subsidence must have been the general rule, but every general subsidence would doubtless be accompanied with local upheavals of a more limited kind. The positions of these upheaved tracts would largely depend upon the original structure of the crust. The action would occur in lines which, once taken as lines of weakness or relief from the intense strain, would probably be used again and again at successive paroxysms or more tranquil periods of contraction. Mr. Mallet has ingeniously connected these movements with the linear direction of mountain chains, volcanic vents, and earthquake shocks.

Mountains may arise from three causes: 1, from the corrugation of the earth's crust due to the effects of secular contraction; 2, from accumulation of materials poured out of volcanic orifices; and, 3, from isolation of elevated masses of ground, owing to the removal, by denudation, of the materials originally connecting them, and to the consequent formation of valleys. Mountains formed in the volcanic way are almost always conical, and are either solitary, as Etna, or occur in linear groups, like the volcanoes of Java. Those formed by denudation are of minor dimensions, and deserve rather the name of hills. Mountain-chains, on the other hand, which are the dominant features of the earth's surface, though they may have lines of volcanic vents along their crests, are not formed essentially of volcanic materials, but of the sedimentary and crystalline rocks of the crust which have been ridged up into vast folds. If the continental lands may be compared to great undulations of the solid surface of the globe, the mountain-chains may be likened to the breaking crests of such wave-like movements. In their internal structure, mountain-chains bear witness to the intense crumbling of the rocks during the process of upheaval. As a consequence of the uprise of two or more parallel ranges of mountains, lines of longitudinal valleys must be produced. But no sooner is a mass of land raised above the sea than it is exposed to the attacks of air, rain, frost, springs, glaciers, or other meteoric agents of disintegration. Its surface is then worn down, the flow of water down its sides cuts out gulleys, ravines, and valleys, so that eventually a very rugged surface is produced, on which, probably, no portion of the original surface of upheaval may remain, but where new lines of minor ridge and valley may appear as the combined result of internal geological structure and atmospheric denudation. During the movements by which mountain masses have been upheaved, the stratified rocks have been so compressed as to occupy, in many cases, but a small proportion of the horizontal extent over which they originally extended. They have adjusted themselves to this diminished area by undergoing intense plication, and thus acquiring a much greater vertical depth. On the other hand, they have been abundantly fractured, some portions of their mass being pushed up, others being let down, so that the crust is traversed with a kind of complicated network of fissures.

The greater part of the geological changes are produced by agencies active at the earth's surface. These agents are material and visible, and we can see and feel their action. The movements of the air; evaporation from land and sea; rain, hail, and snow; the flow of rivers and glaciers; the tides, waves, and currents of the ocean; the growth and decay of organized existence on land and sea; the whole circle of movement now in progress must come into view. *Epigene* is suggested as a convenient term for this visible action, antithetical to *hypogene*, or subterranean action, already considered. A simple arrangement of this part of geological dynamics will be in three sections: 1. Air—the influence of the atmosphere in forming and destroying rocks; 2. Water—the geological functions of the action of the sea and of the circulation of water through the air, and between sea and land; 3. Life, or the part taken by plants and animals in preserving, destroying, and reproducing geological formations. The words destructive, reproductive, and conservative, employed in describing the operations of the epigene agents, do not necessarily imply that anything useful to man is destroyed, reproduced or preserved. On the contrary, the destructive action of the atmosphere may turn barren rock into rich soil, while its reproductive effects sometimes turn rich land into barren desert. Again, the conservative influence of vegetation has sometimes for centuries retained as barren morass what might otherwise have become rich meadow or luxuriant woodland. The terms are used in a strictly geological sense, to denote the removal and reproduction of material and its agency in preserving what lies beneath it.

The *Movements of the Air* are due to the differences in the pressure or density of the atmosphere, the law being that the air always moves from areas of high pressure to areas of low pressure. Atmospheric pressure is determined by temperature and aqueous vapor. Warm air rises, cold air falls. Horizontal currents flow from the cooler regions to replace the volumes which ascend in the warmer. To this cause the trade winds and the well-known land and sea breezes are due. As watery vapor increases, the density of the air is lessened. Moist air, like warm air, has a tendency to rise. The ascent of moist air lessens the atmospheric pressure, which is shown by a fall in the barometer. When vapor rises to the upper atmospheric regions it expands, cools, condenses, and descends in rain. Unequal and rapid heating of the air, and the accumulation of aqueous vapor, and perhaps some influences not understood, create great disturbances in pressure, resulting in storms, hurricanes, and cyclones. The fall of a tenth of an inch in an hour

in the barometer is usually followed by violent storms. When atmospheric pressures are widely different in neighboring localities the wind will move from the area of high to that of low pressure, and if the difference in pressure be great, a fierce storm is likely to occur. The average pressure of the air in motion is rated as follows: In a calm, no movement, no pressure; light breeze, 14 m. an hour, 1 lb. to the sq. foot; strong breeze, 42 m. an hour, 9 lbs.; strong gale, 70 m. an hour, 25 lbs.; hurricane, 84 m. an hour, 36 lbs. The changes produced by the air are both chemical and mechanical, and often inseparably united. If chemical, they appear in oxidation (rust) of metals, in the absorption of carbonic acid by rocks, and the production of earthy carbonates and bicarbonates, which promote the process of decomposition. Dry air has little oxidizing power; moisture is needed for the process. Every housewife knows that iron forks will long remain free from rust if kept from moisture. In towns the air takes up sulphuric and nitric acid to such an extent as to corrode metal surfaces as well as the mortar of walls, which may often be seen to swell out and drop off, owing to the conversion of its lime into sulphate.

Expansion and contraction are produced in rocks, as in other substances, by heat and cold. In regions where the range of temperature is great, there is much difficulty in finding building materials that will not be seriously affected by such changes. An engineer of the United States army some time ago investigated the expansion of certain materials. He found that in fine grained granite the rate for every degree of Fahrenheit was .000004825; for crystalline marble, .000005668; and in red sandstone, .000009532, or about twice as much as in granite.

Freezing Water expands and exerts an enormous strain upon any inclosed cavities or walls which contain it. In severe cold, trees often burst from the expansion of frozen sap. The winds, by driving loose sand over rocks, give them a smoother surface. Prof. Dana asserts that at Cape Cod holes have been drilled in window glass by drifting sand. Cavities are sometimes hollowed in rocks by gyrating sand and fragments of stone. Hurricanes are geological agents, inasmuch as they tear down trees and sometimes impede the drainage of a country and give rise to peat morasses. The term "weathering" includes all the superficial changes which rocks undergo in consequence of atmospheric action. Everywhere disintegration is going on more or less rapidly.

Of all the terrestrial agents by which the surface of the earth is geologically modified, by far the most important is *water*. This substance exists in three forms; 1, vapor, invisible; 2, liquid, or water; 3, solid, as ice. By the sun's heat vast quantities of vapor are continually raised from the surface of the seas, rivers, lakes, snow-fields, and glaciers of the world. This vapor remains invisible until the air containing it is cooled down to below its dew-point, or point of saturation. At first, minute particles appear, which either remain in the liquid condition, or, if the temperature be sufficiently low, are frozen into ice. As these changes spread over a considerable area of sky they give rise to the phenomena of clouds. Further condensation augments the size of the cloud-particles, and at last they fall to the earth, if liquid, as rain, if solid, as snow or hail. On the higher elevations they fall in snow, and form glaciers, which send down their drainage to the valleys and plains. Much of the rain sinks into the ground to gush out again in springs, while the remainder pours down the slopes of the land, feeding brooks and torrents, which, swollen further by the springs, unite in rivers through which the drainage of the land is carried to the sea. From the sea the vapor again rises, to re-appear in clouds and showers and to feed the streams of the land. Here is a vast system of circulation in perpetual renewal. And in all the system there is not a drop of water which is not busy with its allotted task of changing the face of the earth. When the vapor ascends into the air it is almost chemically pure. But when, after being condensed into visible form, and working its way over or under the surface of the land, it once more enters the sea, it is no longer pure, but more or less loaded with material taken by it out of the air, rocks, or soils through which it has traveled. Day by day the process is advancing. So far as we know it has never ceased since the first shower fell upon the earth. We may well believe, therefore, that it must have worked marvels upon the surface of the planet in past time, and that it may effect vast transformations in the future.

Under the head of **TERRESTRIAL WATERS**, we must consider rain, underground water, brooks, rivers, lakes, frost, river ice, snow, hail, and glaciers. Rain produces two changes on the surface: it acts chemically on soils and stones, and sinking into the ground, continues a series of similar reactions there. It also acts mechanically by washing away loose materials, and thus powerfully affecting the contours of the land. Rain contains carbonic acid absorbed from the air, and some other ingredients, in addition to its natural hydrogen and oxygen. Rain water contains on the average $2\frac{1}{2}$ per ct. of gas which is composed of 66.4 nitrogen, 31.2 oxygen, and 2.4 carbonic acid. Common salt, ammonia, sulphates, nitric acid, inorganic dust, and organic matter are usually present in minute quantities in rain water. The ingredients chiefly effective in chemical reactions are oxygen, carbonic acid, and organic matter. The effect of water upon rocks and other solid matter scarcely needs explanation. It is always more or less in the direction of decomposition. There is probably no known substance which is not, under some condition, soluble in water containing carbonic acid or other natural

re-agents. As rain is so universally distributed over the globe, this chemical action must be of very general occurrence. The usual results of the fall of rain upon a land surface must be a disintegration and consequent lowering of that surface. To form a true conception of this action we need to watch what takes place over a wide region. The whole land surface over which rain falls is exposed to waste. The superficial covering of decayed rock or soil is constantly, though slowly, traveling downward to the sea. In this ceaseless transport rain acts as the great common carrier. The particles of rock loosened by the atmospheric waste, by frost, or by the chemical action of the rain itself, are washed off to form a new soil. But they, as well as the particles of the soil, are, step by step, moved downward over the face of the land till they reach the nearest brook or river, whence their seaward progress may be rapid. A heavy rain discolors the water-courses of a country, because it loads them with the fine débris which it removes from the general surface of the land. In this way rain serves as the means whereby the work of the other disintegrating forces is made conducive to the general degradation of the land. The decomposed crust produced by weathering, which would otherwise accumulate over the solid rock and protect it from further decay, is removed by rain so as to expose a fresh surface to further decomposition. This decay is general and constant, but not uniform. In some places, from the nature of the rock, from the flatness of the ground, or from other causes, rain works under great difficulties. There the rate of waste must consequently be extremely slow. In other places, again, the rate may be rapid enough to be appreciable from year to year. A survey of this department of geological activity shows how the unequal wasting by rain has helped to produce the details of the present condition of the land; those tracts where the destruction has been greatest, forming hollows and valleys, others, where it has been less, rising into ridges and hills. Rain-action is not always merely destructive. Usually it is accompanied by reproductive effects, and, as already remarked, the molded rock which it washes off furnishes materials for the formation of soil. In favorable situations it has gathered together accumulations of loam and earth from neighboring higher ground—the “brick-earth,” “head,” and “rain-wash” of the south of England—earthy deposits, sometimes full of angular stones, derived from the subaerial waste of neighboring rocks.

The phenomena of *Hypogenic Action* must be accompanied with very considerable changes in the rocks which form the earth's outer crust. The importance of heat in the transformations of rocks is fully admitted. Two sources of subterranean heat have had their agency in the production of hypogenic changes: 1. the internal heat of the globe; 2. the heat due to the transformation of mechanical energy in the crumbling, fracturing, and crushing of the rocks of the crust as these have been from time to time compelled to adjust themselves to the diminishing diameter of the more rapidly cooling and contracting interior. In pursuing the investigation we have to consider the temperature, from the lowest at which any change is possible up to that of complete fusion; the nature of the rock operated upon, some materials being much more susceptible to change from heat than others; the pressure under which the heat acts, the potency of this agency being much increased with increase of pressure; the presence of water, whereby chemical changes take place which would not be possible in dry heat. It may be concluded that the manner in which rocks have been melted within the crust is not that more simple fusion which we can accomplish artificially, but that it has involved conditions which have not been successfully imitated in any laboratory or furnace. It may be considered that while some rocks, like obsidian or pitchstone, which so closely resemble artificial glasses, may have been derived from a simple igneous fusion, such as can be imitated in a furnace, the great majority of rocks have had a more complex origin, and in a great number of cases can be proved to have been mingled with more or less water, while they were still fluid. In the second place, there can be no question that, in the great hypogenic laboratory of nature, rocks have been softened and fused under enormous pressure. In one instance such pressure has been calculated to equal that of an overhanging mass of rock 50,000 ft. high.

The process called sublimation, by which mineral substances can be obtained in a crystallized form from the condensation of vapors, may be the result of the mere cooling and reappearance of bodies which have been vaporized by heat and afterward solidified by cooling, or, from the solution of these bodies in other vapors or gases, or from the reaction of different vapors upon each other. These operations frequently occur at volcanic vents and in the crevices of recently erupted and still hot lava streams. They have been successfully imitated by experiments. Superheated steam is endowed with a remarkable power of dissolving that intractable substance, silica; artificially heated to the temperature of the melting point of cast-iron, it rapidly attacks silica, and deposits the mineral in snow-white crystals as it cools. Besides the influence of pressure in raising the melting point of subterranean rocks, and in permitting water to remain fluid among them at temperatures far above the boiling point, even at a red, or perhaps, a white heat, we have to consider the effect produced by the same agent upon rocks already solidified. The simplest and most obvious result of pressure upon such rocks is their consolidation, as where a mass of loose sand is gradually compacted into a more or less coherent stone, or where a layer of vegetation is compressed into peat, lignite, or coal. If pressure becomes extremely unequal, or if the rock can escape from

the influence in one or more directions, there will be a disturbance or rearrangement of the particles which are by this means made to move upon each other. These disturbances are: 1. cleavage, from strong lateral pressure; 2. pebbles and organic remains squeezed into each other; 3. the formation of jets of metal or rock material by some great pressure; 4. compression, or plication, produced by the cooling and shrinking of the earth, as shown in contracted rocks; 5. faults or dislocations resulting from elevation or upheaval.

While subterranean heat has had a large part in the construction of the materials of the earth's crust, water, on the other hand, has performed a hardly less important share of the task. Fire and water have often co-operated in such a way that the result must be taken as their joint achievement; but we are now to consider the changes produced by water, pure or otherwise, and at ordinary or other temperatures. All rocks at or near the earth's surface contain water, not chemically in combination, but in their pores. Most of it evaporates when the stone is freely exposed to the air. Rocks differ in water-absorbing capacity. Gypsum will take from one-half to one and one-half per ct. by weight; granite a third of one per ct.; quartz scarcely anything; chalk 20 per ct. All surface rocks contain water, and no mineral substance is strictly impervious to the passage of liquid. It is now well understood that there is probably no terrestrial substance which, under proper conditions, is not to some extent soluble in water. The mere presence of pure water within the pores of subterranean rocks must change their composition. Some of the more soluble materials must be dissolved, and as the water evaporates, must be deposited in a new form. But water in a natural state is never chemically pure. In its descent through the air it absorbs oxygen and carbonic acid, besides other impurities, and as it filters through the soil it abstracts more carbonic acid, as well as other results of decomposing organic matter; thence it effects numerous decompositions of the rocks underneath. The nature of these changes may be inferred from the composition of spring water. Two important kinds of chemical decomposition must evidently arise from the action of such infiltrating water. 1. The presence of the organic matter must exercise a reducing power on oxides. This will be more especially the case with those of iron, the nearly insoluble hematite being reduced to the protoxide, which, converted into carbonate, is readily removable in solution. There can be little doubt that by this means a vast amount of ferruginous matter is extracted from subterranean rocks and carried to the surface. 2. The presence of carbonic acid enables the water to attack vigorously the mineral constituents of rocks. Alkaline carbonates, with carbonates of lime and magnesia, and protoxides of iron and manganese, are produced, and these substances borne onward in solution give rise to further reactions among the rocks through which they are carried. "In the decomposition of rocks," says Bischof, "carbonic acid, bicarbonate of lime, and alkaline carbonates bring about most of the decompositions and changes in the mineral kingdom." The microscopic study of rocks has thrown much light upon the mineralogical alterations in rocks due to the influence of percolating water. Even the most solid-looking, unweathered rocks, are found to have been affected by such metamorphism. Their hydrous magnesian silicates, for example, are partially or wholly converted into such hydrous forms as serpentine, chlorite or delessite. The process of conversion may often be watched. It can be seen to have advanced along the fissures or cleavage-planes of the minerals, leaving the intervening sections still fresh; or it may be observed to have proceeded in such a way that diffused alteration-products are dispersed in filaments or irregular patches through the base of the rock, or gathered together and even recrystallized in cavities; or the whole rock, as in many serpentines, has undergone an entire transformation. Much information regarding such internal alterations of rocks may be obtained from the study of *pseudomorphs*, that is, crystals having the external form of the mineral of which they originally consisted, with the internal structure and composition of the mineral which has replaced it. Serpentine representing olivine, clay taking the place of rock-salt, silica that of wood, and marcasite that of molluscan shells, are familiar examples. There is no reason to doubt that these changes may, in the course of ages, have been effected at ordinary temperature by water descending from the surface of the ground. But two other considerations require to be taken into account in the discussion of the internal transformations of rocks by subterranean water. 1. The water has often been at a high temperature. Mere descent into the crust of the earth will raise the temperature of the water until, if this descent be prolonged, a point far above 212° Fahr. may be reached. Experiments have shown that the chemical action of water is vastly increased by heat. Thus M. Daubrée exposed a glass tube containing about half its weight of water to a temperature of about 400° centigrade. At the end of a week he found the tube so entirely changed into a white, opaque, powdery mass as to present not the least resemblance to glass. The remaining water was highly charged with an alkaline silicate containing 63 per ct. of soda and 37 per ct. of silica, with traces of potash and lime. The white solid substance was ascertained to be composed almost entirely of crystalline materials. These consisted partly of minute, perfect, limpid bipyramidal crystals of quartz, but chiefly of very small acicular prisms of wollastonite. It was found, moreover, that the portion of the tube which had not been directly in contact with the water was as much altered as the rest, whence it was inferred that at these high temperatures and pressures the vapor of water acts

chemically like the water itself. 2. The effect of pressure must be recognized as most important in enabling water, especially when heated, to dissolve and retain in solution a larger quantity of mineral matter than it otherwise could do. In M. Daubrée's experiments just cited, the tubes were hermetically sealed and secured against fracture, so that the pressure of the greatly superheated vapor had full effect. By this means, with alkaline water, he not only produced the two minerals above mentioned, but also feldspar and diopside. It is important to observe that the three conditions required for these changes—the presence of alkaline water, a high temperature, and considerable pressure—are precisely those which can be affirmed to exist abundantly within the crust of the earth. We must admit that rocks originally at the surface may have been so depressed as to come within the influence of internal heat, and may contain within their pores abundant interstitial water more or less charged with alkaline carbonates. Rocks under these conditions, so far as we can judge, can hardly escape internal decomposition and recombination. Mere descent to a great depth beneath the surface will not necessarily result in metamorphism, as has been shown in the Nova Scotian and South Welsh coal-fields, where sandstones, shales, clays, and coal-seams can be proved to have once been depressed 14,000 to 17,000 ft. below the sea-level, under an overlying mass of rock, and yet to have sustained no serious alteration. Perhaps the failure of change may be explicable on the supposition that these carboniferous strata were comparatively dry. But where rocks possess sufficient interstitial water, and are depressed within the crust so as to be exposed to a considerable temperature and to great pressure, they must be metamorphosed—the extent of the metamorphism depending partly upon the vigor of the attack made upon them by the water, partly on their own composition and proneness to chemical change, and partly upon the length of time during which the process was continued. A metamorphosed rock must thus be one which has suffered a mineralogical rearrangement of its substance. It may or may not have been a crystalline rock originally. Any rock capable of alteration (and all rocks must be so in some degree) will, when subjected to the required conditions, become a metamorphic rock. The resulting structure, however, will, in some cases, bear witness to the original character of the mass. A sedimentary rock, for example, consisting of alternate layers of different texture and composition will doubtless retain, even in its metamorphosed condition, traces of that fundamental structure. The water will travel more easily along certain layers than along others; some laminae will be more readily affected, or will give rise to a set of reactions different from those of contiguous layers. Hence the rearrangement and recrystallization due to metamorphism will take place along the predetermined lines of stratification, so long as these lines have not been effaced or rendered inoperative by any other geological structure. It is doubtless to this cause that the foliated character of gneiss, mica-schist, and so many other metamorphic rocks is to be ascribed. In the process of metamorphism, therefore, as well as in that of fusion, to which reference has already been made, the influence of water would seem to have been always conspicuous. Indeed, it is extremely difficult in many cases to draw a line between the results of metamorphism and igneous fusion, or to decide whether a rock should be called igneous or metamorphic. It has been pointed out, for example, that in many rocks which have undoubtedly been in a fluid condition, as proved by their injected veins and dikes, the constituent minerals have not appeared in the form of their respective fusibilities. Scheerer, Elie de Beaumont, and Daubrée have shown how the presence of a comparatively small quantity of water in such rocks has contributed to suspend their solidification, and to promote the crystallization of their silicates at temperatures considerably below the point of fusion. In this way the solidification of quartz in granite after the crystallization of the silicates, unintelligible on the supposition of mere dry fusion, becomes explicable.

It scarcely needs to be stated that there is underground water almost everywhere, and that everywhere it is producing effects similar to those produced by surface water. That water really circulates underground, and passes not merely between the rocks, but in crevices and tunnels which it has no doubt to a large extent opened for itself along natural joints and fissures, is proved by the occasional rise of leaves, twigs, and live fish in the shafts of artesian wells. These facts prove that the water travels leagues and leagues under the surface of the earth. The temperature of underground springs is an indication of the depth from which they rise. Very cold springs probably derive their water from glaciers or snow-covered summits. The hottest springs are found in volcanic districts, but there are warm springs far away from such districts. Assuming a rise of one degree of heat for each 60 ft. in depth, the source of a spring whose temperature is 120° would be 4,200 ft. below the surface, and water at the boiling point should rise nearly 13,000 feet. The underground circulation of water has great interest for the geologist, from the light which it affords as to the changes that rocks undergo, and the manner in which these changes are effected. As in the case of rain, underground water acts both chemically and mechanically. Leaving processes and coming directly to results we find, since every spring is busily engaged in bringing mineral substances from below ground to the surface, that there must evidently be a vast amount of subterranean waste, and many tunnels, channels, and caverns must, in consequence, be formed. To take one illustration: the warm springs of Bath, with a mean temperature of 120° Fahr., are impregnated with sulphates of lime and soda, and chlorides of

sodium and magnesium. Prof. Ramsay has estimated their annual discharge of mineral matter to be equal to a square column 9 ft. in diameter and 140 ft. in height. It is in calcareous regions that the extent of the subterranean loss can be most strikingly seen. Sometimes a district of limestone is drilled with vertical cavities ("swallow holes" or "sinks") formed by the solution of the rock by the descent of carbonated rain-water. Surface-drainage is there intercepted, and passes at once underground, where, in course of time, an elaborate system of channels may be dissolved out of the solid rock. Such has been the origin of the Peak caverns of Derbyshire, the intricate grottoes of Antiparos and Adelsberg, and the vast labyrinths of the Mammoth cave of Kentucky. In the course of time the underground rivers open out new courses, and leave their old ones dry. By the falling in of the roofs of caverns near the surface, brooks and rivers are occasionally engulfed, which, after a long subterranean course, may issue to the surface again in a totally different surface area of drainage to that in which they took their rise, and sometimes, as in Florida, with volume enough to be navigable almost up to their outflow. In such circumstances lakes may be formed over the broken-in caverns; and valleys may thus be deepened, or perhaps even formed. Mud, sand, and gravel, with the remains of plants and animals, are swept below ground, and sometimes accumulate in deposits there. This has been the origin of ossiferous caverns, and of the loam and breccia so often found in them. These wonderful results of the subterranean circulation of water appeal to the imagination, and are those usually most dwelt upon as evincing the potency of this kind of geological agency. And yet the thoughtful observer who reflects upon this subject, will perhaps be led to perceive that even more important than these visible caverns and grottoes are the silent unobtrusive changes so constantly in progress in the solid heart of the rocks. As far down as percolating water reaches there is not a particle of mineral matter safe from its attacks. And, as we have seen, it is hardly possible to find any rock which does not bear throughout its minute grains and pores evidence that water has filtered through it, removing some substances and putting others in their place. In its passage along fissures and channels of the rocks, the underground water not merely dissolves materials chemically and removes them in solution, it likewise loosens some of the finer particles from the sides of these subterranean conduits and carries them along in mechanical suspension. We may occasionally observe, where a spring gushes forth at the surface, that grains of sand are brought up in the clear sparkling water. This removal of material sometimes produces remarkable surface changes when it takes place along the side of a steep slope or cliff, such as those which occur in river valleys, or by the sea-coast. Let us suppose a thin layer of some porous material, like loose sand or ill-compacted sandstone, to lie between two more impervious rocks, such as masses of clay or limestone, and that this porous stratum sloping down from higher ground comes out to the surface near the base of a line of abrupt cliff. The water which finds its way down into this layer will use it as its channel of escape, and traveling along its course will issue in springs or in a more general oozing forth along its outcrop at the foot of the declivity. Under these circumstances, the support of the overlying mass of rock is apt to be loosened. The water not only removes piecemeal the sandy layer on which that overlying mass rests, but, as it were, lubricates the rock beneath. Consequently at intervals, portions of the upper rock may break off and slide down into the valley or plain below. Such dislocations are known as *landslips*. Many illustrative examples might be cited. Thus, in the year 1839 a mass of chalk on the Devonshire coast slipped over a bed of clay into the sea, leaving a rent three-quarters of a mile long, 150 ft. deep, and 240 ft. wide. The shifted mass, bearing with it houses, roads, fields, was cracked, broken, and tilted in various directions, and was thus prepared for further attack and removal by the waves. On many parts of the coasts of Britain there are landslips on a large scale which doubtless took place many centuries ago, or even, in some cases, beyond the times of human history. The undercliff of the isle of Wight, the cliffs w. of Brandon Head, county Kerry, the basalt escarpments of Antrim, and the edges of the great volcanic plateaus of Mull, Skye, and Rasay, furnish illustrations of such prehistoric landslips. Of continental examples, the well known fall of the Rossberg, behind the Righi in Switzerland, is one of the most memorable. After a rainy summer in 1806, a large part of one side of the mountain, consisting of sloping beds of hard red sandstone and conglomerate, resting upon soft sandy layers, gave way. Thousands of tons of solid rock suddenly swept across the valley of Galdan, burying four villages, with about 500 of their inhabitants. In 1855, a mass of debris, 3,500 ft. long, 1000 ft. wide, and 600 ft. high, slid into the valley of the Tiber, which, dammed back by the obstruction, overflowed the village of San Stefano to a depth of 50 ft., until drained off by a tunnel.

The surface drainage of the globe is through brooks and rivers, which carry to lakes and seas, not only the surplus surface-water, but immense quantities of material torn from the land. Like all other moving water, streams have both a chemical and a mechanical action. The substances held in solution in river-water include carbonates of lime, magnesia, and soda; silicates, peroxides of iron and manganese; sulphates of lime, magnesia, potash, and soda; chlorides of sodium, potassium, calcium, and magnesium; silicate of potash; nitrates, and organic matter. As an average, there are 21 parts of mineral matter in 100,000 of water, and carbonate of lime makes up one-half

of all the solid matter. It has been calculated that the Rhine carries annually to the sea enough carbonate of lime to make 332,000,000,000 of oyster-shells of ordinary size. Sulphate of lime is the next most abundant mineral. An English scientist estimates that there may be every year dissolved by rain one hundred tons of rocky matter to each square mile of the earth's surface. The mechanical action of running streams needs no explanation. The enormous deposits made near the mouths of great rivers, and the constant effort to preserve channels and harbors, are always before us. The deltas of the Nile and the Mississippi are instances of the enormous transporting power of rivers. Three thousand miles from the gulf of Mexico the Missouri river starts a yellow stream of mud, gathering more and more as it goes on, and with the added volume of the Mississippi, the Ohio, and other streams, bears its mud to the gulf.

In Africa, Livingstone found rivers whose composition seemed to be more of sand than of water. The power of running water for abrasion or wearing away is well illustrated in the case of the falls of Niagara, where the stream may have fallen over the Queenstown cliff when the river first sought its way to the sea. But much more probably the escarpment and waterfall began to arise simultaneously and from the same geological structure. As the escarpment grew in height, it receded from its starting-point. The river ravine likewise crept backward, but at a more rapid rate, and the result has been that at present the cliff, worn down by atmospheric causes, stands at Queenstown, while the ravine extends 7 m. further inland, with a width of from 200 to 400 yards, and a depth of from 200 to 300 feet. In this, as in other cases, the waterfall has cut its way backward up the course of its stream, and will continue to do so as long as the structure of the gorge continues as it is now—a thick bed or beds of limestone resting horizontally upon soft shales. The softer strata at the base are undermined, and slice after slice is cut off from the cliff over which the cataract pours. It has been estimated that, at their present rate of recession, the Niagara falls must have taken about 35,000 years to cut their way backward, and excavate the gorge between their present position and Queenstown. In other cases, waterfalls have been produced by the existence of a harder and more resisting band or barrier of rock crossing the course of the stream, as, for instance, where the rocks have been cut by an intrusive dike or mass of basalt. In these and all other cases, the removal of the harder mass destroys the waterfall, which, after passing into a series of rapids, is finally lost in the general abrasion of the river-channel. The most marvelous river gorges in the world are those of the Colorado region in North America. The rivers there flow in ravines thousands of feet deep and hundreds of miles long, through vast table-lands of nearly horizontal strata. The Grand Canyon (ravine) of the Colorado river is 300 miles long, and in some places more than 6,000 feet in perpendicular depth. The country is hardly to be crossed, except by birds, so profoundly has it been trenched by these numerous gorges. Yet the whole of this excavation has been effected by the erosive action of the streams themselves.

Lakes are fresh or salt; those having outlets are usually fresh; those having none are usually salt. The geological functions of lakes are: 1. To arrest and equalize drainage by regulating the outflow and preventing or lessening the destructive effects of floods; 2. To filter river water and permit the undisturbed accumulation of new deposits, which, in some modern cases, may cover thousands of square miles of surface; 3. To furnish an abode for a lacustrine fauna and flora, to receive the remains of the plants and animals washed down from the surrounding country, and to entomb all those organisms in the growing deposits so as to preserve a record of the terrestrial life of the period. Salt lakes are of two classes: 1. Those which owe their saltiness to the evaporation and concentration of the fresh water poured into them by their feeders; 2. Those which were originally parts of the ocean. Of the first order are Great Salt lake in Utah, and many smaller ones. They were doubtless fresh at first, but ages of evaporation have condensed the salt and made them what they are. The Caspian sea is the most conspicuous specimen of the second class. This was no doubt a part of the Black sea and the Mediterranean, as the formation of the surrounding country shows. The surface of the Caspian is now more than 80 ft. below that of the Black sea. Along the shallow pools which border the Caspian a constant deposition of salt is taking place, sometimes forming a layer of rose-colored crystals on the bottom, or gradually becoming dry and covered with drift-sand. This concentration of the water is still more marked in the great bay called the Karaboghaz, which is connected with the middle basin of the Caspian by a channel 150 yards wide and 5 ft. deep. Through this narrow mouth there flows from the main sea a constant current which Von Baer estimated to carry daily into the Karaboghaz 350,000 tons of salt.

In the form of ice, water performs important geological operations, in the five conditions of frost in general, frozen lakes and rivers, hail, snow, and glaciers. It is well known that water expands in freezing. At 30° Fahr. the pressure is 146 atmospheres, or the weight of a column of ice a mile high, which is equal to 276,000 lbs. per sq. foot. Cannons and bombshells filled with water have been burst by the expansion of ice. Such an agency must be of great geological importance. Soils and rocks are pushed asunder by the expanding ice, and their cohesion is loosened or destroyed so that when a thaw comes they seem as if they had been ground down in a mortar. In Spitzbergen and on the coast of Greenland the amount of destruction caused by frost is enormous. The short and warm summer, rapidly melting the snow, fills the pores and joints of the

rocks with water, which, when it freezes, splits off large blocks of rock from the hills and sends them down to the valleys, where they are further broken up by similar causes. At the breaking up of ice in the spring many transformations are made. Large rocks are carried from shores, and sometimes from the hollows, to remote points; shores are abraded or heaped with new material, and in many cases disastrous overflows are the result. Hail is infrequent and its consequences are not important. Now and then the pellets are large enough to strip trees of their leaves, and even to kill animals and cattle, but such results are exceptional. Snow is a more important factor in meteorology or geology. There is a snow-line or elevation at which snow is perpetual over all the earth, varying from 19,000 ft. above sea-level, in the region of the Himalayas, to less than 3,000 ft. in the extreme north or south. Snow is both conservative and destructive. As a conservative force, it protects the soil from frost, and thereby protects crops and roots from freezing and winter-killing. On mountain slopes snow may create avalanches, which in their descent may be very destructive. (For GLACIERS, see *ante*.)

We come to the *ocean*, which, as a dynamical agent in geology, may be studied from two points:—1, its movements; 2, its geological work. Its movements are tides, currents, and waves. Tides are the oscillations caused by the attraction of the sun and the moon. In the Atlantic ocean the tidal movement is 600 miles an hour. In the open sea this movement is of little consequence, but when the tidal wave enters a narrow or shallow sea the rates of motion and of force are greatly increased, and it is in such places that tides acquire their geological importance. Tides vary in height from nothing to 70 feet. The most remarkable effect of this narrowing and compression is seen in the bay of Fundy, in Nova Scotia, where the flow from the sea raises the water to a height of 70 ft. or more. Other illustrations may be found on the w. coast of Scotland, and on the coast of Norway. In the Pentland firth the current runs 10 m. an hour. Recent researches in ocean temperature have disclosed the remarkable fact that beneath the surface-layer of water affected by the temperature of the latitude there lies a vast mass of cold water, the bottom temperature of every ocean in free communication with the poles being little above and sometimes actually below the freezing point of fresh water. In the north Atlantic a temperature of 40° Fahr. is reached at an average depth of about 800 fathoms, all beneath that depth being progressively colder. In the equatorial parts of the same ocean the same temperature comes to within 300 fathoms of the surface. In the South Atlantic, off the cape of Good Hope, the mass of cold water below 40° comes likewise to about 300 fathoms from the surface. This distribution of temperature proves that there must be a transference of solid polar water towards the equator, for in the first place the temperature of the great mass of the ocean is much less than that which is normal to each latitude, and in the second place, it is lower than that of the superficial parts of the earth's crust underneath. On the other hand, the movement of the water from the poles to the equator requires a return movement of compensation from the equator to the poles, and this must take place in the superficial strata of the ocean. Apart, therefore, from those rapid river-like streams which traverse the ocean, and to which the name of current is given, there must be a general drift of warm surface-water towards the poles. This is doubtless most noticeable in the north Atlantic, where, besides the current of the gulf stream, there is a prevalent set of the surface waters towards the n.e. As the distribution of life over the globe is everywhere so dependent upon temperature, it becomes of the highest interest to know that a truly arctic submarine climate exists everywhere in the deeper parts of the sea. With such uniformity of temperature we may anticipate that the abyssal fauna will be found to possess a corresponding sameness of character, and that arctic types may occur on the ocean-bed, even at the equator. But besides this general drift, or set, a leading part in oceanic circulation is taken by the more defined streams termed currents. The tidal wave becomes one of translation only as it passes into shallow water, and is thus of but local consequence. But a vast body of water, known as the equatorial current, moves in a general westerly direction round the globe. Owing to the way in which the continents cross its path, this current is subject to considerable deflexions. Thus that portion which crosses the Atlantic from the African side strikes against the coast of South America, and divides, one portion turning towards the s., and skirting the shores of Brazil, the other bending north-westward into the gulf of Mexico, and issuing thence as the well-known gulf-stream. This equatorial water is comparatively warm and light. At the same time the heavier and colder polar water moves towards the equator, sometimes in surface currents, like those which skirt the eastern and western shores of Greenland, but more generally as a cold under-current which creeps over the floor of the ocean as far as the equator.

Waves and ground-swell are other features of oceanic action. Sometimes these waves are disastrous, but commonly they are of little consequence. The sea is never still. There is always a great though scarcely perceptible swell; but when this swell nears the shore, the upper portion of water, traveling faster than the lower, rises into huge foam-crested billows or walls of water, which break with enormous force upon the beach. In the north of Scotland such billows often throw their spray to the height of 200 ft. It is estimated that a single roller of the ground-swell, 20 ft. high, falls with a pressure of about a ton on every square foot. The diminution of atmospheric pressure during a cyclone tends to raise the level of the sea within the cyclone's limits and

give rise to enormous waves. On Oct. 5, 1864, during a great cyclone which passed over Calcutta, the sea rose 24 ft., sweeping everything before it, and drowning 48,000 people.

Three chief types of sea-ice have been observed. In the arctic sounds and bays the littoral waters freeze along the shores and form a cake of ice which, upborne by the tide, and adhering to the land, is thickened by successive additions below, as well as by snow above, until it forms a shelf of ice 120 to 130 ft. broad, and 20 or 30 ft. thick. This shelf, known as the ice-foot, serves as a platform on which the abundant débris loosened by the severe frosts of an arctic winter gathers at the foot of the cliffs. It is more or less completely broken up in summer, but forms again with the early frosts of the ensuing autumn. The surface of the open sea likewise freezes over into a continuous sheet, which in summer breaks up into separate masses, sometimes of large extent. This is what navigators term "floe-ice," and the separate floating cakes are known as "floes." Ships fixed among these floes have been drifted with the ice for hundreds of miles, until at last liberated by its disruption. In the Baltic sea, off the coast of Labrador and elsewhere, ice has been observed to form on the sea bottom. It is known as ground-ice, or anchor-ice. In the Labrador fishing-grounds it forms even at considerable depths. Seals caught in the lines of these depths are brought up sometimes solidly frozen. In the Arctic regions the vast glaciers which drain the snow-fields and descend to the sea, extend for some distance from the land, until large fragments break off and float away seawards. These detached masses are icebergs. Their shape and size vary greatly, but lofty peaked forms are common, and they sometimes rise from 200 to 200 ft. above the level of the sea. As only about a ninth part of the mass appears above water, those larger bergs may sometimes be from 2,000 to 3,000 ft. thick, from base to top. They consequently require water of some depth to float them, but they are often seen aground. In the antarctic regions, where one vast sheet of ice envelopes the land and extends as a high rampart into the sea, the detached icebergs often reach immense size, and are characterized by the frequency of a flat tabular form.

The *Influence of Climate* is one of the most important geological agencies. Ocean currents from warm regions raise the temperature of the places into which they flow; currents from cold regions lower it. The ocean is the great distributor of temperature over the earth. Note the opposite sides of the Atlantic. Along the North American coast runs the cold arctic current, greatly depressing what would be the normal temperature. On the coast of Europe the gulf stream pours the warm water of the tropics, and correspondingly heightens the temperature. Dublin and the s.e. point of Labrador are in the same latitude, yet the mean temperature of Labrador is 18° lower than that of the Irish capital.

Another great geological force is found in the works of erosion by the sea, which is accomplished in four ways: 1. the enormous force of the breakers, which suffices to tear off fragments of solid rock; 2. the alternate compression and expansion of air in the crevices of the rocks exposed to heavy breakers, which dislocate rocks even above the limits of wave action; 3. the hydraulic pressure of those portions of large waves which enter fissures and cavities, forcing asunder masses of rock; 4. the waves using loose materials to batter down the cliffs exposed to their attacks. The dislodgement of immense masses of loose materials especially from rocky cliffs, is too well known to need elucidation. All along the coasts of England, Scotland, and Norway the waves are gnawing down the rocky shores. Blocks of granite weighing 50 tons or more have been torn out and tossed about as though they were of wood. These assaults of the waves are remarkably aided by a curious action of the air. At the Eddystone lighthouse, a door which had been securely fastened against the surf without, was actually driven outward by a pressure from within, the strong bolts and hinges being broken. It must be inferred that the sudden sinking of a great mass of water created a partial vacuum and that the air inside the lighthouse forced itself out to restore the equilibrium. But the greatest amount of erosion accomplished by the sea is due, not to its own direct mechanical impetus, but to the blows dealt by the boulders, gravel, or sand which it drives against the shores. This is a kind of perpetual artillery playing against the land, here and there making breaches. This incessant attack from the sea has worn from the rocks the wonderful caves of Staffa and others of similar character along the w. coasts of Ireland, Scotland, and the Shetland and Orkney islands. The general result of the erosive action of the sea on the land is the production of a submarine plain. As the sea advances by cutting slice after slice away from the coast, successive lines of beach pass under low-water mark. The whole of the littoral belt, as far down as wave action has influence, is continually being ground down by the moving detritus. If no change of level between sea and land should take place, the sea might conceivably eat its way slowly far into the land, and produce a gently sloping yet almost horizontal selvage of plain covered permanently by the waves. In such a submarine plain the influence of geological structure, and notably of the relative powers of resistance of different rocks would make itself conspicuous. The present promontories caused by the superior hardness of their component rocks would no doubt be represented by ridges on the sub-aqueous plateau, while the existing bays and creeks worn out of softer rocks would be marked by lines of valleys or hollows.

Living Organisms have much to do with geological changes. Plants and animals co-operate with inorganic agents in promoting the degradation of the land, and on the

other hand, they protect rocks from decay. Plants keep the surface of rocks moist, and promote mechanical and chemical dissolution. In their decay they produce acids which are potent in decomposing rocks and in disintegrating soils. Of the destructive influence of animal life numerous illustrations may be given. 1. The composition and arrangement of soil are affected. Worms are continually engaged in bringing up the lower portions of the soil to the surface, thus increasing its fertility and its capability of being washed away by rain. Burrowing animals, by throwing up the soil and subsoil, expose these to be dried and blown away by the wind. At the same time their subterranean passages serve to drain off the superficial water and to injure the stability of the surface of the ground above them. In Britain, the mole and rabbit are familiar examples. In North America the prairie dog and the gopher have driven excavations under extensive tracts of pasture land in the west. In Cape Colony wide areas of open country seem to be in a constant state of eruption from the burrowing operations of multitudes of *Buthyergis* and *Chrysochloris*—small mole-like animals which bring up the soil and bury the grassy vegetation under it. 2. The flow of streams is sometimes interfered with, or even diverted, by the operations of animals. Thus the beaver, by constructing dams, checks the current of water-courses, intercepts floating materials, and sometimes even diverts the water into new channels. This action is typically displayed in Canada, and other parts of North America. The embankments of the Mississippi are sometimes weakened to such an extent by the burrowing of the cray-fish, as to give way, and allow the river to inundate the surrounding country. Similar results have happened in Europe from the subterranean operations of rats. 3. Some mollusca bore into stone or wood, and by the number of contiguous perforations, greatly weaken the material. Pieces of drift-wood are soon riddled with long holes by the teredo, while wooden piers, and the bottoms of wooden ships are often rapidly perforated. The saxicavous shells, by piercing rocks and opening cavities for rain and sea-water to fill, promote the decay of the stone. 4. Many animals exercise a ruinously destructive influence upon vegetation. Of the many insect plagues of that kind it will be enough to mention the locust, phylloxera, and Colorado beetle. The pasture in some parts of the s. of Scotland has in recent years been much damaged by mice, which have increased in numbers owing to the indiscriminate shooting and trapping of owls, hawks, and other predaceous creatures. Grasshoppers cause the destruction of vegetation in some parts of Wyoming and other western territories of the United States. The way in which animals destroy each other, often on a great scale, may likewise be included among the geological operations now under description.

Against these forms of destruction may be placed forms of conservative or reproductive action, shown chiefly in *Vegetation*. The slightest vegetation, to some extent, protects the surface from erosion, gives it solidity, and induces further vegetation. Vast sandy tracts have been to some extent redeemed by the judicious planting of trees that broke the force of the wind. In a similar way marine plants protect rocks along the shores. In mountain districts pine forests exercise an important influence in preventing the formation or arresting the progress of avalanches. Both plants and animals contribute materials towards new geological formations. Their remains are inclosed in deposits of sand and mud and there preserved. But they form of themselves not unimportant accumulations. Of plant formations the following illustrative examples may be given. 1. Peat-mosses are accumulations of marshy vegetation which occur in temperate and arctic latitudes, sometimes to a depth of 40 ft. or more. In Europe they have been largely formed by plants of the genus *Sphagnum*, which, growing as a spongy fibrous mass over wet ground, die in their lower parts and send out new fibers above. It is this lower decaying stratum which forms the peat. Every stage of the process may be seen in a large moss; from the green living plants at the top, through fibrous brown turf full of the scarcely decayed rootlets of the *Sphagnum* down to the compact brown or almost black peat at the bottom. Many peat-mosses were at one time lakes which have been gradually filled up by the accumulation of marsh plants. Peat possesses a great antiseptic power; the bodies of animals which have been entombed in it are sometimes preserved for many centuries. 2. Mangrove swamps are found on the low moist shores and river mouths of tropical countries, and the mangrove tree plays an important geological part. It grows in such situations in a dense jungle, sometimes 20 m. broad, which fringes the coast as a green selvage, and runs up or quite occupies creeks and inlets. The mangrove flourishes in sea-water even down to low-water mark, forming there a dense thicket which, as the trees drop their radicles and take root, grows outward into the sea. It is singular to find terrestrial birds nesting in the branches above, and crabs and barnacles living among the roots below. By this network of subaqueous radicles and roots the water is filtered of its sediment, which, retained among the vegetation, helps to turn the spongy jungle into a firm soil. On the coast of Florida the mangrove swamps stretch for a long distance as a belt from 5 to 20 m. broad, which winds round the creeks and inlets. At Bermuda the mangroves co-operate with the grasses and other plants to choke up the creeks and brackish lakes. In these waters calcareous algae abound, and as their remains are thrown up amidst the sand and vegetation they form a remarkably calcareous soil. 3. *Diatom, mud or earth*, the minute siliceous plants called diatoms occur both in fresh and salt water, deposit their congregated remains both on the site of lakes and on the sea-floor. "Infusorial" earth and "tripoli powder" consist mainly of the fragmentary débris of diatoms which have

accumulated on the bottoms of lacustrine areas. Towards the antarctic circle the "Challenger" met with *diatomaceæ* in abundance, both in the surface waters of the ocean and on the bottom. At depths of from 1260 to 1975 fathoms they form a pale straw-colored deposit, which when dried is white and very light. Animal formations are chiefly composed of the remains of the lower grades of the animal kingdom, especially of *mollusca*, *actinozoa*, and *foraminifera*. 1. In some cases they are calcareous. Lime, chiefly in the form of carbonate, is the mineral substance of which the solid parts of animals are mainly built up. Hence the great majority of accumulations formed of animal remains are calcareous. In fresh water they are represented by the marl of lakes—a white, chalky deposit of the mouldering remains of *Mollusca*, *Ectinostroaca*, and partly of fresh-water *Algae*. On the sea-bottom in shallow water they consist of beds of shells, such as the oyster-banks of English seas. The fringing barriers found at all coral-reefs of warm seas are conspicuous examples of wide and thick masses of rock formed from the accumulated growth of animal organisms. The great reef of Australia, for example, is 1250 m. long, from 10 to 90 broad, and more than 1800 ft. thick. The coral rock, though formed by the continuous growth of the polyps, gradually loses any distinct organic structure, and acquires an internal crystalline character owing to the infiltration of water through its mass, whereby carbonate of lime is carried down and deposited in the pores and crevices as in a growing stalactite. Great quantities of calcareous mud are produced by the breakers which beat upon the outer edge of the reefs. This mud is partly washed up on the reefs and aids in their consolidation, but in great measure is swept away by the ocean currents and distributed over many thousands of square m. of the sea-floor. In deep water over the bed of the Atlantic and many other oceans a remarkable calcareous ooze occurs which is formed of the remains of *Foraminifera*, and chiefly of species of the genus *Globigerina*. It is next in abundance to the red and gray clays of the deep sea. It is a pale gray marl, sometimes red from peroxide of iron, or brown from peroxide of manganese; and it usually contains more or less clay, even with occasional fragments of pumice. 2. Siliceous deposits formed from animal exuviae are illustrated by another of the deep sea formations brought to light by the "Challenger" researches. In certain regions of the western and middle Pacific ocean, the bottom was found to be covered with an ooze consisting almost entirely of *Radiolaria*. These minute organisms occur, indeed, more or less abundantly in almost all deep oceanic deposits. From the deepest sounding yet taken (4,575 fathoms, or more than 5 miles) a radiolarian ooze was obtained. The spicules of sponges likewise furnish materials towards these silicious accumulations. 3. Phosphatic deposits, in the great majority of cases, betoken some of the vertebrate animals, seeing that phosphate of lime enters largely into the composition of their bones, and occurs in their excrement. The most typical modern accumulations of this nature are the guano beds of rainless islands off the western coast of South America, and Southern Africa. In these regions immense flocks of sea-fowl have, in the course of centuries, covered the ground with an accumulation of their droppings to a depth of, in some places, 30 to 80 feet, or even more. This deposit, consisting chiefly of organic matter and ammoniacal salts with about 20 per ct. of phosphate of lime, has acquired a high value as a manure, and is being rapidly cleared off. It could have been preserved only in a rainless or almost rainless climate. On the west of Europe isolated stacks and rocky islands in the sea are often seen to be white from the dropping of seabirds; but it is merely a thin crust, gaining no great depth in a climate where rains are frequent and heavy.

No survey of the geological workings of plant and animal life upon the surface of the globe is complete which does not take account of the *Influence of man*—an influence of enormous and increasing consequence in physical geography, for man has introduced what seems superficially an element of antagonism to nature. Not content with gathering the fruits and capturing the animals which nature has offered for his sustenance, he has, with advancing civilization, engaged in a contest to subdue the earth and possess it. His warfare, indeed, has often been a blind one, successful for the moment, but leading to sure and sad disaster. He has, for instance, stripped the forests from many a region of hill and mountain, gaining his immediate object in the possession of their stores of timber, but exposing the slopes to parching droughts or fierce rains. Countries once rich in beauty and plenteous in all that was needful for his support, are now burnt and barren, or washed bare of their soil. But now when that truth is coming more and more to be recognized and acted on, man's influence is none the less marked. His object is still to subdue the earth; and he attains it, not by setting nature and her laws at defiance, but by enlisting her in his service. The action of man may be witnessed on climate, on the flow of water, on the character of the terrestrial surface, and on the distribution of life. Human interference affects meteorological conditions—by removing forests and laying bare to the sun and winds areas which were previously kept cool and damp under the trees, or which, lying on the lee side, were protected from tempests; as already stated, it is supposed that the wholesale destruction of the forests formerly existing in countries bordering the Mediterranean has been in part the cause of the desiccation of these districts by drainage, the effect of this operation being to remove rapidly the discharged rainfall, to lessen evaporation, and thereby to diminish the rainfall and somewhat increase the general temperature of a country; by the other processes of agriculture, such as the transformation of moor and bog into cultivated land, and the

clothing of bare hillsides with green crops or plantations of coniferous and hardwood trees. By increasing or diminishing the rainfall man directly affects the course of the waters over the land. By his drainage operations, he makes the rain to run off more rapidly than before, and thereby increases the floods in the rivers. By wells, bores, mines, or other subterraneous works he interferes with the underground waters and consequently with the discharge of springs. By embanking rivers he confines them to narrow channels, sometimes increasing their scour, and enabling them to carry their sediment further seaward, sometimes causing them to deposit it over the plains and raise their level. Man's operations alter the aspect of a country in many ways; by making forest-clad mountains bare, or clothing bare mountains with forest; by promoting the growth or causing the removal of peat-mosses; by heedlessly uncovering sand-dunes, and thereby setting in motion a process of destruction which may convert hundreds of acres of fertile land into waste sand, or by prudently planting the dunes with sand-loving vegetation or pines, and thus arresting their landward progress; by so guiding the course of rivers as to make them aid him in reclaiming waste land and bringing it under cultivation; by piers and bulwarks, whereby the ravages of the sea are stayed; or by the thoughtless removal from the beach of stones which the waves had themselves thrown up, and which would have served for a time to protect the land; by forming new deposits either designedly or incidentally. The roads, bridges, canals, railways, tunnels, villages, and towns with which man has covered the surface of the land will in many cases form a permanent record of his presence. Under his hand the whole surface of civilized countries is very slowly covered with a stratum, either formed wholly by him, or due in great measure to his operations, and containing many relics of his presence. The earth of old cities has been raised many feet by the rubbish of his buildings; the level of the streets of modern Rome stands high above that of the pavements of the Cæsars, and that again above the roadways of the early republic. Over cultivated fields his potsherds are turned up in abundance by the plow. The loam has risen within the walls of his graveyards, as generation after generation has moldered there into dust. It is on the *Distribution of Life*, perhaps, that the most subtle of human influences come. Some of man's doings in this domain are indeed plain enough, such as the extirpation of wild animals, the diminution or destruction of some forms of vegetation, the introduction of plants and animals useful to himself, and especially the enormous predominance given by him to the cereals and to the spread of sheep and cattle. But no such extensive disturbance of the normal conditions of the distribution of life can take place without carrying with it many secondary effects, and setting in motion a wide cycle of change and of reaction in the animal and vegetable kingdoms. For example, the incessant warfare waged by man against birds and beasts of prey in districts given up to the chase leads sometimes to unforeseen results. The weak game is allowed to live which would otherwise be killed off and give room for the more healthy remainder. Other animals which feed perhaps on the same materials as the game are by the same cause permitted to live unchecked, and thereby to act as a further hindrance to the spread of the protected species. But the indirect results of man's interference with the regime of plants and animals still require much prolonged observation.

STRUCTURAL GEOLOGY treats of the architecture of the earth's crust, beginning with stratification and its accompaniments; aqueous or sedimentary rocks are arranged in layers or strata, the strata expressing their leading structural feature. The general aspects of stratification will be best followed in an explanation of the terms by which they are expressed. *Lamine* are the thinnest paper-like layers of deposit in a stratified rock. These layers will generally split apart, but sometimes are so compact that the rock breaks the soonest. *Lamine* occur only where the material is fine grained, as in mud or shale. The existence of *lamine* points to tranquil conditions of slow intermittent deposit. A great thickness of laminated rock, like the massive shales of paleozoic formation, points to a prolonged period of quiescence, and probably in most cases to slow and tranquil subsidence of the sea-floor. *Strata* or *beds* are layers of rock from an inch or less up to many feet in thickness. A stratum may be made of many *lamine*, and this has commonly been the case where the sediment has been exceedingly fine-grained. Where the materials are of coarser grain, the strata, as a rule, are not laminated, but form the thinnest parallel divisions of the mass of rock. Strata are usually, with more or less ease, separable from each other. A stratum may be one of a series of similar beds in the same mass of rock, or may be complete and distinct in itself, as where one of limestone or iron-stone runs through the heart of a series of shales. As a general rule we may conclude that wherever, among sedimentary accumulations, stratification is exceedingly well marked, the rocks were formed rather slowly; and that where it is weak or absent, the conditions of deposit were more rapid, without the intervals and changes necessary for the production of the distinctly stratified structure. *False-bedding, current-bedding*, is where some strata, especially sandstones, are marked by an irregular lamination, wherein the *lamine*, though for short distances parallel to each other, are oblique to the general stratification of the mass, at constantly varying angles and in different directions. Such a structure indicates frequent changes in the direction of the currents by which the sediment was carried along and deposited. *Irregularities of bedding*, due to *unequalities of deposition* or of *erosion*, indicate that a ridge of sand or gravel is laid down under water by current action of some strength. Should the motion of the water diminish, finer sediment may be brought to the place,

and be deposited around and above the ridge. In such a case the stratification of the latter accumulation will end off abruptly against the flanks of the older ridge, which will appear to rise up through the overlying bed. Appearances of this kind are not uncommon in some coal-fields, where they are known to miners as "rolls," "swells," or "horses' backs." A structure exactly the reverse occurs where a stratification has been scooped out before the deposition of the layers which cover it. Such channels have evidently been water-courses, worn out of the coal-measure strata, at a comparatively recent geological period, and subsequently buried under glacial accumulations. There is a complete discordance between them and the paleozoic strata below, pointing to the existence of a vast interval of time. *Ripple-marks* in sandstone are wavy ridges and hollows, such as may be seen on any shore from which the tide has retired. Their general direction suffices to indicate the quarter whence the chief movement of the water has come. Such indications of shallow-water conditions may often be observed among old crenaceous deposits, as in the Cambrian and Silurian rocks. *Sun-cracks, rain-pittings*, etc., prove that during deposition aqueous strata have been laid bare to the air and the sun. The nature and validity of this evidence will be best ascertained by observations made at the margin of the sea, or of any inland sheet of water, which, from time to time, leaves tracts of mud or fine sand exposed to sun and rain. Their existence in any strata proves that the surface of the rock on which they lie was exposed to the air and dried before the next layer of water-borne sediment was deposited upon it. Prints of rain-drops are often associated with these marks, and these serve sometimes to show from which direction the wind was blowing when the rain fell. Proofs of shallow shore-water, and of exposure to the air, are supplied by markings left by animals. Voidings and trails of worms, tracks of mollusks and crustaceans, fin-marks of fishes, footprints of birds, reptiles, and mammals, may all be preserved and give their evidence regarding the physical conditions under which sedimentary formations were accumulated.

Gas-spurts appear in some strata in the form of little heaps of various shapes, and are conjectured to be due to the intermittent escape of gas from decomposing organic matter in the original sand or mud, as we now sometimes see in the mud flats of rivers and estuaries. The *order of superposition* is the foundation of geological chronology. As strata are laid down upon one another in a more or less nearly horizontal position, the underlying beds must be older than those which cover them. This obvious truth is termed the "law of superposition," and furnishes the means of determining the chronology of rocks, and, though other methods are employed, they must all be based upon the observed order of superposition. The only cases where the apparent superposition may be deceptive is where the strata have been inverted. In the Alps, the rocks composing great mountain masses have been so completely overturned that the highest beds appear to be covered by others which ought properly to be underneath them. Such conditions, however, are exceptional. *Alternations of strata* show that certain repetitions occur with tolerable regularity. Sandstones are interleaved with shale above, and then pass into shale; the latter may become sandy at top and be finally covered with sandstone, or may become calcareous and pass into limestone. A sandstone group indicates water of comparatively little depth, moved by changing currents, and bringing the sand alternately from one side to the other. Limestone above the shale shows that the water cleared, owing to a deflection of the sediment-carrying currents, or to a continued and perhaps more rapid subsidence, and that corals, crinoids, mollusks, and other lime-secreting organisms established themselves upon the spot. Shale overlying limestone tells of fresh inroads of mud by which animal life was destroyed. In studying *associations of strata* we find that certain kinds commonly occur together, because the conditions under which they were formed were apt to arise in succession. A seam of coal is almost invariably found to lie in a bed of fire-clay, or on some argillaceous stratum. This is because the fire-clay formed the soil on which the plants grew that went to form the coal. When the clay was laid down under suitable circumstances vegetation sprang up upon it. Turning to the *relative persistence of strata* we observe that some kinds of sediment are much more widely spread than others, and therefore some kinds of sedimentary rocks possess far greater persistence than others. Usually the coarser the grain the more local the extension of the rock. Conglomerates are thus by far the most variable of all sedimentary formations. Sandstones are less liable to extremes, but are apt to thin out and then swell again. Shales are far more persistent, the same zone often being traceable for many miles. Limestones display remarkable continuity, and coal-seams often present remarkable persistence. *Overlap* is where strata have been laid down in a subsiding region wherein the area of deposit gradually increased, and the sediment spread over a progressively augmenting surface, whereby the later portions of a sedimentary series are extended over and repose upon the earlier portions. As to the *relative lapse of time* represented by strata and intervals between them, we can form no satisfactory estimates.

In all speculations in the case we must bear in mind that the length of time represented by a given depth of strata is not to be estimated merely from their thickness or lithological character. The intervals between the deposit of two successive laminae of shale may have been as long as, or longer than, that required for the formation of one of the laminae. In like manner, the interval needed for the transition from one stratum or kind of stratum to another may often have been more than equal to the time required

for the formation of the strata on either side. But the relative chronological importance of the bars or lines in the geological record can seldom be satisfactorily discussed merely on lithological grounds. This must mainly be decided on the evidence of organic remains. By this kind of evidence it can be made nearly certain that the intervals represented by strata were in many cases much shorter than those not so represented; in other words, that the time during which no deposit of sediment went on was longer than that wherein deposit did take place. Passing from individual strata to groups of strata, the geologist makes two bases of classification: 1. Lithological characters; 2. Organic remains. The first is uncertain, and everywhere variable. It is by the remains of plants and animals imbedded among the stratified rocks that the most satisfactory subdivisions of the geological record can be made. A chronological succession of organic forms can be made out among the rocks of the earth's crust. A certain common type is found to characterize particular groups of rock, and to hold true even though the lithological constitution of the strata should greatly vary. Moreover, though comparatively few species are universally diffused, they possess remarkable persistence over wide areas, and even when they are replaced by others, the same general facies of fossils remains. Hence the stratified formations of two countries geographically distant, and having little or no lithological resemblance to each other, may be compared and paralleled, zone by zone, simply by means of their inclosed organic remains.

Joints traverse all rocks, more or less distinctly, by vertical or highly inclined divisional planes. Soft rocks, such as loose sand and uncompacted clay, do not show these joint lines; but wherever a mass of clay has been subjected to some pressure and condensation, it will usually be found to have acquired them. It is by means of the intersection of joints that rocks can be removed in blocks, and the quarryman takes advantage of these natural planes of division.

The inclination of rocks would satisfy the most casual observer that the rocks now visible at the earth's surface are seldom in their original position. The inclination of rocks is termed their *dip*, and the amount is expressed in degrees measured from the plane of the horizon; thus rocks standing vertical have a dip of 90°. The edges of strata where they come to the surface are the *outcrop* or *boutset*. A line drawn at right angles to the dip is called the *strike* of the rocks. Miners call this strike the *level course* or *level-bearing*. The movements which the crust of the earth has undergone have not only folded up and corrugated the rocks, but have fractured them in all directions; the result being called *dislocations of rocks*. These dislocations may be simple *fissures*, that is, rents without any vertical displacement of the mass on either side; or may be *faults*, that is, rents where one side has been pushed up or has sunk down. Another system of divisional planes is known as *cleavage*, by which rocks are sometimes traversed. When this cleavage is well developed it divides the rock into parallel laminae, which run at a high angle quite independently of stratification or any other divisional planes. Cleavage is most perfect in fine-grained material, hence it is admirably shown in argillaceous rocks. With regard to *igneous rocks* as a part of the structure of the earth's crust, the general law which has governed their intrusion within the crust may be thus stated: Every fluid mass impelled upwards by pressure from below, or by the expansion of its own imprisoned vapor, has sought egress along the line of least resistance. What that line was to be, has depended in each case upon the structure of the terrestrial crust and the energy of the eruption. In many instances it has been determined by an already existing dislocation; in others by the planes of stratification, or by the surface of junction of two unconformable formations, or by irregular rents and cracks, or by the more complex lines of weakness. Sometimes the intruded mass has actually fused and obliterated some of the rock which it has invaded, incorporating such portion into its own substance. The shape of the channel of escape has necessarily determined the form of the intrusive rock, as the mold regulates the form of a casting of molten iron. Igneous rocks may be arranged under four heads, according to the shape in which they have solidified: 1. Amorphous masses; 2. Sheets; 3. Veins and dykes; 4. Necks. The first are chiefly crystalline coarse-textured rocks, of which granite and syenite are the most conspicuous; sheets are masses of crystalline rock intruded between other rocks. Many of the older volcanic rocks occur in this form, such as feldstone, quartz, porphyry, dolerite, basalt, and others. Coal seams, when invaded by intruded sheets of igneous matter, assume different aspects, according to the thickness and nature of the invading sheet, the depth of the coal seam, and other conditions. In some cases the coal has been fused, and has acquired a blistered or vesicular texture, the gas cavities being either empty or filled with mineral matter, such as calcite. In other cases the coal has nearly disappeared, the remaining portion being black soot or ashes. In others, still, it has become hard and brittle, and has been converted into a kind of anthracite, owing to the loss of its more volatile portions. Veins of igneous rock may occur indifferently in igneous, aqueous, or metamorphic rocks, and range in diameter from thread-like filaments to masses many feet or yards across. There are veins of segregation and veins of intrusion. Those of segregation are peculiar to crystalline rocks; they abound in many granites, and are found in gneiss and schist. They run as straight, curved, or branching ribands, seldom exceeding a foot in thickness. Most frequently they are finer in texture than the rock which they traverse, but occasionally the reverse is the case; especially in granite. These veins are so welded to the rock that they cannot

easily be separated along the plane of union. Veins of intrusion are portions of once melted matter injected into rents in previously solidified rocks. *Dykes* are wall-like masses of igneous rock, filling vertical or highly inclined fissures. They present as great a variety of thickness as is shown by the veins. Sometimes they occur as plates of rock only an inch or two in thickness; at other times they attain a breadth of ten or twelve fathoms. The name is given because the formation presents the appearance of a wall, and their sides are often as parallel and perpendicular as those of a piece of masonry. *Necks* are the filled up pipes or funnels of former volcanic vents. When a volcano ceases action its vent is left full of igneous matter which soon solidifies. The wash of surface by rains and other agencies in old volcanic regions has laid these necks bare. They are usually circular or elliptical, but occasionally of a more branching or irregular form. The materials are sometimes crystalline, sometimes fragmental, and there may be some form of lava. The fissures which so abundantly traverse the crust of the earth have, in many instances, served as places for the deposit of mineral matter forming *mineral veins*. These veins or lodes vary in thickness from less than an inch up to fathoms, and the same vein may, in not far separated parts, have both extremes of thickness. Such veins usually send out shoots, and in some mining districts this has been done to such an extent that it becomes hardly possible to identify the main vein among its numerous offshoots. In some rocks, more especially in limestones, large subterranean cavities have been filled with veinstones and ore. Various theories have been proposed to account for the infilling of mineral veins. Of these, the most noteworthy are: 1. The theory of lateral segregation, which teaches that the substances in the veins have been derived from the adjacent rocks by a process of solution and redeposit; and, 2. The theory of filling from below, according to which the minerals and ores were introduced from below, dissolved in water or steam, or by sublimation, or by igneous fusion and injection. The fact that the nature and amount of the minerals, and especially of the ores in a vein, vary with the nature of the surrounding rocks, seems to show that such rocks have had a certain influence on the precipitation of mineral matter in the fissures passing through them; but that this mineral matter came chiefly from below appears almost certain. The phenomena of the ascent of hot water in volcanic districts afford a close analogy to what has occurred in mineral veins. It is known that at the present time various minerals, including silica, both crystalline and calcedonic, and various metallic sulphides, are being deposited in fissures up which hot water rises. At the same time it is conceivable that to some extent there may be a decomposition of the rocks on either side of a fissure, and that a portion of the mineral matter abstracted may be laid down in another form along the walls of the fissure, or, on the other hand, that the rocks on either side of the fissure may be permeated for some distance by the ascending waters, and that some of the mineral substances carried up in solution may be deposited in the pores and cavities of these rocks as well as in the fissure itself. The last division to notice under structural geology is *unconformability*. Where one series of rocks has been laid down continuously and without disturbance upon another series they are said to be "conformable." Though such rocks may usually be presumed to have followed each other continuously without any great disturbance of geographical condition, we cannot always be safe in such an inference. But an unconformability leaves no room to doubt that it marks a decided break in the continuity of deposit. Hence, no kind of geological structure is of higher importance in the interpretation of the history of the stratified formations of a country. Paramount, though, the effect of unconformability may be in the geological structure of a country, it must nevertheless be in almost all cases local. The disturbance by which it was produced can have affected but a comparatively circumscribed region, beyond the limits of which the continuity of sedimentation may have been undisturbed.

PALEONTOLOGICAL GEOLOGY treats of the structure, affinities, classification, and distribution in time of the forms of vegetable and animal life imbedded in the rocks of the earth's crust, dealing chiefly with fossils. The first question that naturally suggests itself is: How came the remains of plants and animals to be preserved in these old rocks? If we argue from the conditions of the present day, and suppose such conditions to have prevailed in the ancient time, we are not satisfied or enlightened as to such remarkable preservation. The conditions for the preservation of any relics of plant or animal life of a terrestrial surface must be always exceptional. They are supplied only where the organic remains can be protected from the air and from superficial decay. Hence fossils may be found in lakes over the bottoms of which deposits of silt, peat, marl, etc., are formed. Peat mosses are more favorable still for the preservation of ancient fauna. In them wild animals have sunk, and the antiseptic quality of the peat has preserved them from decay. Fauna and flora may be buried in the sand and silt of deltas at the mouths of rivers. Caverns are particularly adapted to the preservation of the higher forms of animal life. Most of our knowledge of the pre-historic mammalian fauna of Europe is derived from what has been disinterred in bone caves. These caves serve as dens for predatory beasts, into which they dragged their prey. In some cases they were merely holes into which animals crawled to die, or in which they were deluged and drowned. The bottom of the sea below tide-mark is favorable to the preservation of marine organisms; and the fossils of the ocean are vastly greater in variety and number and of much more importance in geological study than those of the land. As to the *relative age of fossils*, although absolute dates cannot be fixed in geological chronology, it

is not difficult to determine the relative age of different strata, and consequently of their inclosed organic remains. For this purpose the fundamental law is based on what is termed the "order of superposition." This law may be thus defined: In a series of stratified formations the older must underlie the younger. It is not needful that we should actually see the one lying below the other. If a continuous conformable succession of strata dip steadily in one direction we know that the beds at the one end must underlie those at the other, because we can trace the whole succession of beds between them. The true order of superposition is decisive of the relative ages of stratified rocks. There is nothing in fossils themselves to fix their date; but it is certain that those in the younger strata were ages later in appearance on the earth than those in the older strata. There are two main purposes to which fossils may be put in geological research: 1, to throw light upon former conditions of physical geography, such as the presence of land, rivers, lakes, and seas, in places where they do not now exist; changes of climate, and the former distribution of plants and animals; and, 2, to furnish a guide in geological chronology whereby rocks may be classified according to relative date, and the facts of geological history may be arranged and interpreted as a connected record of the earth's progress. Former land surfaces are revealed by the presence of stumps of trees with roots branching freely in the underlying stratum, which, representing the ancient soil, often contains leaves, fruits, and other sylvan remains, together with traces of the bones of land animals, remains of insects, land-shells, etc. Ancient woodland surfaces of such character are found between tidemarks, and even below low-water line. They unequivocally prove a subsidence of the land. The former existence of lakes can be satisfactorily proved from beds of marl or lacustrine limestone, full of fresh-water shells, or from fine silt with leaves, fruits, and insect remains. Such deposits are abundantly forming at the present day, and they occur at various horizons among the geological formations of past times. Old sea-bottoms are vividly brought before us by beds of marine shells and other organisms. Layers of water-worn gravel and sand, with rolled shells of littoral and infra-littoral species, unmistakably mark the position of a former shore line. Deeper water is indicated by finer muddy sediment, with relics of the fauna which prevailed beneath the reach of waves and ground-swell. Limestones full of corals, or made up of crinoids, point to the slow continuous growth and decay of generation after generation of organisms in clear sea water. The existence of different conditions of climate in former geological periods is satisfactorily demonstrated from the testimony of fossils. Thus an assemblage of the remains of palms, gourds, and melons, with bones of crocodiles, turtles, and sea-snakes, proves a sub-tropical climate to have prevailed over the s. of England in the time of the older tertiary formations. On the other hand, the presence of an intensely cold or arctic climate far s. in Europe during post-tertiary time, can be shown from different kinds of evidence, such as the existence of the remains of arctic animals even as far as France. Observations made over a large part of the globe have enabled geologists to divide the stratified part of the earth's crust into systems, formations, and groups, or series; and it is by their characteristic fossils that the divisions of stratified rocks can be most satisfactorily made, since each formation, being followed and distinguished by its own assemblage of organic remains can be followed and recognized even amid the crumbly and dislocations of a disturbed region. It was at one time believed, and many still hold, that groups of strata characterized by community or resemblance of organic remains were chronologically contemporaneous. But such an inference rests upon most insecure grounds. We may not be able to disprove the assertion that the strata were strictly coeval, but we have only to reflect on the present conditions of zoological and botanical distribution, and of modern sedimentation, to be assured that the assertion of contemporaneity is a mere assumption. Consider what would happen were the present surface of any portion of southern Europe to be submerged by the sea, covered by marine deposits, and then re-elevated into land. The river-terraces and lacustrine marls formed before the time of Julius Cæsar could not be distinguished by any fossil tests from those laid down in modern days, unless traces of human implements were obtainable, whereby the progress of civilization during 2,000 years might be indicated. So far as regards the shells, bones, and plants preserved in the various formations, it would be absolutely impossible to discriminate their relative dates; they would be classed as "geologically contemporaneous," that is, as having been formed during the same period in the history of life in the European area; yet there might be a difference of 2,000 years or more between many of them. Strict contemporaneity cannot be asserted of any strata merely on the ground of similarity or identity in fossils. Still it may be true that lake or sea deposits of widely different characteristics may have been contemporaneous in the time of their deposition, as a lake bottom in America might show certain types of fossils, while an entirely different assortment might at the same period have been settling into the bottom of a lake in Asia. But the grand march of life, in its progress from lower to higher forms, has unquestionably been broadly alike in all quarters of the globe. But nothing seems more certain than that the rate of advance has not everywhere been the same. It has moved unequally over the same region. A certain stage of progress may have been reached in one quarter of the globe thousands of years before it was reached in another; though the same general succession of organic forms might be found in each region. The geological formations form the records of these ages of organic development. In every country

where they are fully displayed and have been properly examined, they can be separated from each other according to their organic contents. Their relative age within a limited geographical area can be demonstrated by the mere law of superposition. Where, however, the formations of distant countries are composed, all that we can safely affirm regarding them is that those containing the same or a representative assemblage of organic remains belong to the same epoch in the history of biological progress in each area; but we cannot assert that they are contemporaneous, unless we are prepared to include within that term a vague period of perhaps thousands of years. *Gaps in the geological record* show that the history of life has been very imperfectly preserved in the stratified parts of the earth's crust. Apart from the fact that, even under the most favorable conditions, only a small proportion of the total flora and fauna of any period could be preserved in the fossil, enormous breaks occur where no record has been preserved at all. It is as if whole chapters and books were missing from a historical work. Fossil evidence, moreover, may be made to prove the existence of gaps which are not otherwise apparent. Changes in organic forms must, on the whole, have been extremely slow in the geological past. The whole species of a sea-floor could not pass entirely away and be replaced by other forms without the lapse of long periods of time. If then among the conformable stratified formations of former ages we encounter sudden and abrupt changes in the facies of the fossils, we may be certain that these must mark omissions in the record, which we may hope to fill in from a more perfect series elsewhere. There have never been any universal interruptions in the continuity of the chain of being, so far as geological evidence can show. But the physical changes which caused the breaks may have been general over a zoological district or minor region. They no doubt often caused the complete extinction of genera and species which had a small geographical range. It is therefore clear that the geological record, as it now exists, is at the best but an imperfect chronicle of geological history. In no country is it complete. The lacunae of one region must be supplied from another; yet in proportion to the geographical distance between the localities where the gaps occur and those whence the missing intervals are supplied, the element of uncertainty in our reading of the record is increased. The most desirable method of research is to exhaust the evidence for each area or province, and to compare the general order of its succession as a whole with that which can be established for other provinces. It is therefore only after long and patient observation and comparison that the geological history of different quarters of the globe can be correlated. *Subdivisions of the geological record* are made by fossils, and they are made the bases for the geological classification of rocks. Thus we may find a particular stratum marked by the occurrence in it of various fossils, one or more of which may be distinctive, either from occurring in no other bed above and below, or from special abundance in that stratum. These species might be used as a guide to the occurrence of the bed in question, which might be called by the name of the most abundant species. In this way a geological horizon or zone would be marked off, and geologists would thereafter recognize its exact position in the series of formations. The first and fundamental point is to determine accurately the order of superposition of strata. Until this is done, detailed paleontological classification may prove to be worthless. But when once the succession of the rocks has been fixed, paleontological evidence may become paramount. It cannot be too frequently stated nor too prominently kept in view that, although gaps occur in the succession of organic remains as recorded in the rocks, there have been no such blank intervals in the progress of plant and animal life upon the globe. The march of life, onward and upward, has been unbroken. Geological history, therefore, if its records in the stratified formations were perfect, ought to show a blending and gradation of epoch with epoch, so that no sharp divisions of the events could be made. But the progress has been constantly interrupted, now by upheaval, now by volcanic outbreaks, now by depression. These interruptions serve as natural divisions in the chronicle, and enable the geologist to arrange his history into periods. A bed, or limited number of beds, characterized by one or more distinct fossils, is termed a zone or horizon, and is often known by the name of a typical fossil, as the different zones in the Lias are by their special species of ammonite. A series of such zones, united by the occurrence among them of a number of the same species or genera, is called a *group*. A series of groups similarly related constitute a *formation*, and a number of formations may be united into a *system*.

STRATIGRAPHICAL GEOLOGY arranges the rocks of the earth's crust in the order of their appearance, and interprets the sequence of events of which they form the records. Its province is to cull from all the other departments of geology the facts which may be needed to show what has been the progress of our planet, and of each continent and country, from the earliest times of which the rocks have preserved any memorial. Thus from mineralogy and petrography it obtains information regarding the origin and subsequent mutations of minerals and rocks; from dynamical geology it learns by what agencies the materials of the earth's crust have been formed, altered, broken, upheaved, and melted; from structural geology it understands how these materials were put together so as to build up the complicated crust of the earth; from paleontological geology it receives, in well-determined fossil remains, a clew by which to discriminate the different stratified formations and to trace the grand onward march of organized existence upon this planet. Though the geological record is at best but an imperfect chronicle of the history of the earth, from this record alone can the progress of the globe be traced. It

contains the registers of the births and deaths of tribes of plants and animals which have from time to time lived on our planet. But a small proportion of the total number of species which have appeared in past time have been thus chronicled, yet by collecting the broken fragments of the record an outline at least of the history of life upon the earth can be deciphered. The nomenclatures adopted for the subdivisions of the geological record bear witness to the rapid growth of geology. It is a patch-work in which no system nor language has been adhered to, but where the influence by which the progress of the science has been molded may be distinctly traced. Some of the earliest names are lithological, and remind us of the fact that mineralogy and petrography preceded geology in the order of birth—chalk, oolite, greensand, millstone grit. Others are topographical, and often recall the labors of the early geologists of England—London clay, Oxford clay, Purbeck, Portland, Kimmeridge beds. Others are taken from local English provincial names—Lias, Gault, Crag, Cornbrash. Others of later date recognize an order of superposition as already established among formations—old red sandstone, new red sandstone. By common consent it is admitted that names taken from the region where a formation or group of rocks is typically developed, are best adapted for general use. Cambrian, Devonian, Silurian, Permian, Jurassic, are of this class, and have been adopted all over the globe. The geological record is classified into five main divisions: 1. The archæan, azoic (lifeless), or eozioc (dawn of life) periods; 2. The primary or paleozoic (ancient life) periods; 3. The secondary or mesozoic (middle life) periods; 4. The tertiary or post-tertiary periods. These divisions are further arranged into systems, each system into formations, each formation into groups, and each group or series into single zones or horizons. The subjoined generalized table exhibits the order in which the chief subdivisions appear:

ORDER OF SUCCESSION OF THE STRATIFIED FORMATION OF THE EARTH'S CRUST.

	BRITAIN.	CONTINENTAL EUROPE.	NORTH AMERICA.
Post-Tertiary, or Quaternary.	Recent—Alluvium, peat, etc. Pleistocene— <i>Cave deposits</i> , <i>Glacial orbit</i> .	Alluvium. Diluvium.	Recent or Terrace. Champlain. Glacial.
Tertiary, or Cenozoic.	Pliocene— <i>Crag deposits</i> of <i>Norfolk and Suffolk</i> . Miocene— <i>Lignite of Borey</i> <i>Tracy, Mull, etc.</i> Eocene— <i>Tertiaries of</i> <i>Hampshire Basin and Isle</i> <i>of Wight</i> .	Pliocene— <i>Tegel</i> , <i>Dinotherium</i> , <i>Sand</i> . Miocene— <i>Leithakalk</i> , <i>Upper Molasse</i> . Oligocene— <i>Lower Molasse</i> , <i>Gres de</i> <i>Fontainebleau, etc.</i> Eocene— <i>Nummulite</i> , <i>Limestone</i> , <i>Flysch</i> .	Sumter. Yorktown. Alabama Lignitic.
Secondary, or Mesozoic.	Cretaceous..... Oolitic..... Jurassic. Liassic..... Triassic.....	Upper. Senonian— <i>Craie blanche et tuffeau</i> , <i>Upper Quadersandstein</i> . Lower. Turonian— <i>Planenkalk</i> . Cenomanian— <i>Grès vert</i> , Gault. Upper. Neocomian. Lower. Upper or White Jura (Malm). Middle or Brown Jura (Dogger). Lower or Black Jura (Lias). Upper. Rhætic beds, Keuper. Muschelkalk. Lower. Bunter.	Fox Hills group. Pierre group. Niobrara group. Benton group. Dakotah group. Jurassic rocks appear to be but poorly developed in North America. Triassic.
Primary, or Paleozoic.	Permian. Carboniferous. Devonian and Old Red sand- stone. Silurian. Cambrian.	Dyas or <i>Zechstein</i> . Permian. <i>Rothliegendes</i> . Terrain houiller, Steinkohlen. Flötzleerer Sandstein. Calcaire, Carbonifère, Kohlenkalk, Kulm. Devonian. Silurian (Transition or Grauwacke system). Primordial Silurian (older Grauwacke and slate). Primitive Schists.	Permian. Carboniferous. Sub-carboniferous. Devonian. Silurian. Primordial Cambrian. Huronian.
Archæan, or Azoic (Eozoic).	Fundamental gneiss.....	Ur. gneiss.	Laurentian.

Upper Missouri
Region.

PHYSIOGRAPHICAL GEOLOGY deals chiefly with the surface of the earth and the changes thereon. When the geologist asks himself how the present distribution of sea and land is to be accounted for, he finds that the answer of the question goes back to early paleozoic times, whence he can in some cases trace the growth of a continent downward through the long cycles of geological time. But there still remains the problem of the original wrinkling of the surface of the globe, whereby the present great ridges and hollows were produced. It is generally agreed that these inequalities have been produced by unequal contraction of the earth's mass, the interior contracting more than the outer crust, which must therefore have accommodated itself to this diminution of diameter by undergoing corrugation. But there seems to have been some original distribution of materials in the globe that initiated the depressions on the areas which they have retained. The matter underlying the oceans is more dense than that beneath the continents, and to this cause, in part at least, must the present position of the oceans be attributed. The early and persistent subsidence of these areas, with the consequent increase of density, seems to have determined the main contours of the earth's surface. Rocks which were originally horizontal, or nearly so, have been crumpled over tracts thousands of square miles in extent, so as to occupy a superficial area greatly less than that which they originally covered. It is evident that they have been horizontally compressed, and that this result can have been achieved only as a consequence of the subsidence of such a curved surface as that of our globe. One writer of eminence supposes that the present inequalities of contour on the earth's surface are from $11\frac{1}{2}$ to 66 times as great as they would have been had they resulted from the contraction of a solid globe; and he has suggested that the earth need not have become solid throughout simultaneously, and consequently may have been considerably larger at the time when a solid crust was formed than it is now. The theory of a hot fluid interior of the earth, so long and so resolutely held by geologists as well as laymen, has in recent times been weightily opposed. But it is the surface and not the interior that we are now considering. The hypothesis of secular cooling and contraction furnishes a natural explanation of the origin of the dominant elevations and depressions on the surface, and of the intense crumpling which the rocks in many regions have undergone. Taking 0.09 as the coefficient of contraction for a supposed stratum 500 m. thick, lying beneath 25 m. of crust, and passing from a fused into a solid state, one investigator concludes that every hundred miles measured along a great circle on the surface would have been one mile longer before the contraction, and that this might produce a triangular elevation of 25 sq. m. on a base of 100 m., which would give a range of mountains half a mile high. If only 50 m. out of the 100 were disturbed, the range would be a mile high, and so on. The effects of this lateral pressure may show themselves either in broad dome-like elevations, or in narrower and loftier ridges of mountain. The structure of the crust is so complex and the resistance offered by it to the pressure is consequently so varied, that abundant cause is furnished for almost any diversity in the forms and distribution of the wrinkles into which it is thrown. It is evident, however, that the folds have tended to follow a linear direction. In North America, from early geological times, they have kept on the whole on the lines of meridians of longitude; in the old world they have chosen diverse trends, but the last great crummings—those of the Alps, Caucasus, and the great mountain ranges of central Asia—have risen along parallels of latitude. Mountain chains must, therefore, be regarded as evidence of the shrinkage of the earth's mass. The theory of secular contraction serves also to show why volcanoes so frequently rise along the mountain ridges. The elevation of the crust, by diminishing the pressure on the parts underneath the upraised tracts, permits them to assume a liquid condition and to rise within reach of the surface, when, driven upwards by the expansion of superheated vapors, they are ejected in the form of lava or ashes. But these subterranean movements form only one phase of the operations by which the outlines of the land have been produced. They have ridged up the solid crust above the sea-level, and have thus given rise to land; but the land as we now see it has acquired its features from the prolonged and varied action of the epigene agents upon rocks of widely varied heights and powers of resistance. It is evident that as a whole the land suffers ceaseless erosion from the time that it appears above water. It is likewise clear, from the nature of the materials composing most of the rocks of the land, that they have been derived from old denudations of the same kind, and thus, side by side with the various upheavals and subsidences, there has been a continuous removal of materials from the land and an equally persistent deposit of these materials under water, and consequent growth of new rocks. The work of rain, of frost, of rivers, of glaciers can be readily discriminated, though they all combine harmoniously toward the achievement of their common task. Taking a broad view of denudation, we may conveniently group together the action of air, frost, springs, rivers, glaciers, and the other agents which wear down the surface of the land, under the common designation of subaerial, and that of the sea as marine. The general results of subaerial action are—to furrow and channel the land, to erode valleys, to sharpen and splinter the ridges of mountains, and thus, while roughening, to lower the general surface and carry the detritus out to sea. The action of the sea, on the other hand, is to plane down the land to the level at which the influence of breakers and ground-swell ceases to have any erosive effect; the flat platform so often visible between tide-marks on a rocky exposed

coast-line, is an impressive illustration of the tendency of marine denudation. The combined result of subaerial and marine action, if unimpeded by any subterranean movement, would evidently be to reduce the land to one general level under the sea. But to reduce a continent to the condition of a submarine plain would require a longer period of time than seems to have elapsed between any two epochs of upheaval. An idea of the magnitude of surface denudation is found in the action of the great Mississippi river, which, it has been estimated, wears away every year from the vast territory drained by it $\frac{1}{100,000}$ th of a foot. At this rate, and taking Humboldt's estimate of 748 ft. as the average height of the continent, the whole of North America would be worn down to the sea-level in about 4,500,000 years—a comparatively short period in geological chronology. Hence it follows that, apart altogether from irregularities of surface due to inequalities of upheaval, every area of land exposed to ordinary subaerial action must in the end be channelled into a system of valleys. Nor would this require a long geological period, for, at the present rate of waste in the Mississippi basin, valleys 800 ft. deep might be made in a million years. Undoubtedly the original features superinduced by subterranean action would guide and modify the operations of running water, though their influence would certainly wane as the features themselves slowly disappeared. In no case, probably, would the aboriginal contour remain through a succession of geological periods. Traces of it might still be discernible, but they would be well nigh effaced by the new outlines produced by the superficial agents. In the vast table lands of Colorado and the western territories of the United States is an impressive picture of the results of mere subaerial erosion on undisturbed and nearly level strata. Systems of stream-courses, and valleys, river gorges unexampled elsewhere in the world for depth and length, vast winding lines of escarpment, like ranges of sea-cliffs, terraced slopes rising from plateau to plateau, huge buttresses and solitary stacks standing like islands out of the plains, great mountain masses towering into picturesque peaks and pinnacles, cleft by innumerable gullies, yet everywhere marked by the parallel bars of the horizontal strata out of which they have been carved, these are the orderly symmetrical characteristics of a country where the scenery is due entirely to the action of subaerial agents on the one hand and the varying resistance of perfectly regular stratified rocks on the other. The Alps, on the contrary, present an instructive example of the kind of scenery that arises where a mass of high ground has resulted from the intense corrugation and upheaval of a complicated series of stratified and crystalline rocks, subsequently for the vast period carved by rain, frost, springs, and glaciers. We see how, on the outer flanks of those mountains among the ridges of the Jura, the strata begin to undulate in long wave-like ridges, and now, as we enter the main chain, the undulations assume a more gigantic tumultuous character, until, along the central heights, the mountains lift themselves towards the sky, like the storm-swept crest of vast earth billows. The whole aspect of the ground suggests intense commotion. Where the strata appear along the cliffs or slopes, they may often be seen twisted and crumpled on the most gigantic scale. Out of this complicated mass of material, the subaerial forces have been ceaselessly at work since its first elevation. They have cut out valleys, sometimes along the original depressions, sometimes down the slopes. They have eroded lake basins, dug out corries or *cirques*, notched and furrowed the ridges, splintered the crests, and have left no part of the original surface unmodified. But they have not effaced all traces of the convulsions in which the Alps were upheaved. The details of the sculpture of the land have mainly depended on the nature of the materials on which nature's erosive tools have been employed. The joints by which all rocks are traversed have served as dominant lines along which the rain has filtered, and the springs have risen, and the frost wedges have been driven. On the high bare scarps of a high mountain, the inner structure of the mass is laid open, and there the system of joints is seen to have determined the lines of crest, the vertical walls of cliff and precipice, the forms of buttress and recess, the position of cleft and chasm, the outline of spire and pinnacle. On the lower slopes, even under the tapestry of verdure which nature delights to hand where she can over her naked rocks, we may detect the same pervading influence of the joints upon the forms assumed by ravines and crags. Each kind of rock, too, gives rise to its own characteristic scenery. The massive crystalline rocks, such as granite, yield each in its own fashion to the resistless attacks of the denuding forces. They are broadly marked off from the stratified rocks in which the parallel bands of the bedding form a leading feature in every cliff and bare mountain slope. Among the latter rocks also, very distinctive types of surface may be observed. A range of sandstone hill, for example, presents a marked contrast to one of limestone. In the physiography of any region, the mountains are the dominant features. A true mountain chain consists of rocks which have been crumpled and pushed up in the manner already described. But ranges of hills almost mountainous in their bulk may be formed by the gradual erosion of valleys out of a mass of original high ground. In this may some ancient table-lands, those of Norway and of the Highlands of Scotland, for example, have been so channelled by deep fjords and glens that they now consist of massive, rugged hills, either isolated or connected along the flanks. The forms of the valleys thus eroded have been governed partly by the structure and composition of the rocks, and partly by the relative potency of the different denuding agents. Where the influence of rain and frost has been slight, and the streams, supplied from distant

sources, have had sufficient declivity, deep, narrow, precipitous ravines or gorges have been excavated. The cañons of the Colorado are a magnificent example of this result. Where, on the other hand, ordinary atmospheric action has been more rapid, the sides of the river channels have been attacked, and open sloping glens and valleys have been hollowed out. A gorge or defile is usually due to the action of a waterfall, which, beginning with some abrupt declivity or precipice in the course of the river when it first commenced to flow, or caused by some hard rock crossing the channel, has eaten its way backward. Lakes may have been formed in several ways. 1. By subterranean movements, as, for example, during those which gave rise to mountain chains. But these hollows, unless continually deepened by subsequent movements of a similar nature would be filled up by the sediment continually washed into them from the adjoining slopes. The numerous lakes in such a mountain system as the Alps cannot be due merely to this cause, unless we suppose the upheaval of the mountains to have been geologically quite recent, or that subsidence must take place continuously or periodically below each independent basin. But there is evidence that the upheaval is not of recent date, while the idea of perpetuating lakes by continual subsidence would demand, not in the Alps merely, but all over the northern hemisphere where lakes are so abundant, an amount of subterranean movement of which, if it really existed, there would assuredly be—as there is not—plenty of other evidence. 2. By irregularities in the deposition of superficial accumulations prior to the elevation of the land or during the disappearance of the ice-sheet. The numerous lakes inclosed within ridges and mounds of drift clay and gravel, are examples. 3. By the accumulation of a barrier across the channel of a stream, and the consequent holding back of the water. This may be done, for instance, by a landslide, by the advance of a glacier across a valley, or by the throwing up of a bank, by the sea, across the mouth of a river. 4. By erosion. The only agent capable of excavating hollows out of the solid rock, such as might form lake-basins, is glacier-ice. It is a remarkable fact, of which the significance may now be seen, that the innumerable lake-basins of the northern hemisphere lie on surfaces of intensely ice-worn rock. The striae can be seen on the smoother rock-surfaces running down into the water on all sides. These striae were produced by ice moving over the rock. If the ice could, as the striae prove, descend into the rock basins and mount up the farther side, smoothing and striating the rock as it went, it could erode the basins. It is hardly possible to convey in words an adequate conception of the enormous extent to which the north of Europe and North America have had their surfaces ground down by ice. The ordinary rough surfaces produced by atmospheric disintegration have been replaced by a peculiar flowing contour, which is traceable even to below the sea-level. The table-lands may sometimes arise from the abrasions of hard rocks and the production of a level plain by the action of the sea, or rather of that action combined with the previous degradation of the land by subaerial waste. But most of the great table-lands of the globe seem to be platforms of little disturbed strata which have been upraised bodily to a considerable elevation. No sooner, however, are they placed in that position than they are attacked by running water, and begin to be hollowed out into systems of valleys. As the valleys sink, the platforms between them grow into narrower and more definite ridges, until eventually the level table-land is converted into a complicated network of hills and valleys, wherein, nevertheless, the key to the whole arrangement is furnished by a knowledge of the disposition and effects of the flow of water. The examples of this process brought to light in the states of Colorado and Nevada, and in Wyoming and the other western territories, by Newberry, King, Hayden, Powell, and other explorers, are among the most striking monuments of geological operations in the world. The materials worn from the surface of the higher are spread out over the lower grounds. We have already traced how streams at once begin to drop their freight of sediment when, by the lessening of their declivity, their carrying power is diminished. The great plains of the earth's surface are due to this deposit of gravel, sand, and loam. They are thus monuments at once of the destructive and reproductive processes which have been in progress unceasingly since the first land rose above the sea, and the first shower of rain fell. Every pebble and particle of their soil, once part of the distant mountains, has traveled slowly and fitfully downward. Again and again have these materials been shifted, ever moving downward and seaward. For centuries, perhaps, they have taken their share in the fertility of the plains and have ministered to the necessities of flower and tree, of the bird of the air, the beast of the field, and of man himself. But their destiny is still the great ocean. In that bourne alone can they find undisturbed repose, and there, slowly accumulating in massive beds, they will remain until, in the course of ages, renewed upheaval shall raise them into future land, there once more to pass through the same cycle of change.—[In large part condensed from *Encyclopædia Britannica*, 9th edition.]

GEOPHAGISM, the custom of dirt-eating, indulged in by the lowest order of savages, most particularly in Terra del Fuego. A kind of ferruginous clay is regularly sold for food in certain parts of Bolivia. The practice is usual among the negroes of the West Indies, and to some extent among North American Indians, while Laplanders mix clay with the flour of which they make their bread.

GEOPONEKA, a Greek treatise upon agriculture written in the time of and dedicated to the emperor Constantine, the successor of the first Christian emperor. The work is divided into twenty parts, treating of the cultivation adapted to various soils and crops, and the rural labors suited to the different seasons of the year; with directions for the sowing of the various kinds of corn and pulse; the training of the vine, and the art of wine-making, upon which the author is particularly diffuse. He also treats of olive plantations and oil-making, of orchards and fruit-trees, of evergreens, of kitchen-gardens, and of the insects and reptiles that are injurious to plants. He exemplifies the economy of the poultry-yard, mentions the treatment best adapted for horses, asses, and camels, suggests improvement in the condition of horned cattle, sheep, goats, pigs, etc., and dwells upon the care they require; describes the best method of salting meat; and, lastly, treats of the various kinds of fishes. Every chapter is inscribed with the name of the author from whom it is taken, and the compiler gives at the beginning of the first book a list of his principal authorities, amongst whom were Africanus, Anatolius, Apulius, Damogeron, Democritus, Didymus, Dionysius Utiensis (the translator of Mago, the Carthaginian writer on agriculture), Diophanes, Florentinus, Leontius, Pamphilus, Paxamus, the Quintili, Varro, and Zoroaster. Other authors in addition to these are quoted. The work is curious, as giving a course of ancient agriculture collected from the best authorities then existing.

GEORGE I. (CHRISTIAN WILLIAM FERDINAND ADOLPHUS GEORGE), King of Greece, second son of the king of Denmark, and brother of the princess of Wales, b. 1845, served for some time in the Danish navy. When, in 1863, Otho I., king of Greece, resigned his crown, the government, after vainly offering the vacant throne to prince Alfred of England and duke Ernest of Saxe-Coburg Gotha, eventually chose prince Christian, who with the concurrence of his own family and the consent of the great powers, accepted it, and ascended the throne of Greece as king George I. He was married at St. Petersburg to the princess Olga, daughter of the grand duke Constantine, Oct. 27, 1867. The princess Olga was born Sept. 3, 1851.

GEORGE V. 1819-78; last king of Hanover; son of Ernest Augustus and of a sister of queen Louisa of Prussia. When he ascended the throne in 1851, on the death of his father, he was afflicted with blindness. His policy was unfortunate, and in 1866 Hanover became a part of the German confederation. King George fled to Vienna where he continued to agitate against Prussia. In 1868 he mediatized his kingdom for the sum of 16,000,000 thalers, but his enmity to Prussia declared itself so strongly that he was threatened with non-payment of the sum agreed upon.

GEORGE, Prince of Denmark, 1653-1708; second son of Frederick III. He fought in person against Charles XI. of Sweden. In 1683 he married princess Anne the second daughter of James II. of England, by whom he had 17 children, all of whom died before their mother became queen of England. Prince George was devoid of talent and ambition, but was brave and humane. Through his wife's influence he deserted James in the hour of need. After the triumph of the prince of Orange, prince George was naturalized and created duke of Cumberland. He was present at the battle of the Boyne, and when his wife ascended the throne he was created lord high admiral.

GEORGE, Duke of Saxony, the second son of king John, b. 1832. He entered the artillery service, and gave evidence of his bravery in the campaign of 1866, when he commanded a brigade of cavalry. At the outbreak of the Franco-German war in 1870 he was in command of the first division of the Saxon army corps, but after the battle of Metz, he commanded the fourth army corps, which he led at the battle of Sedan, and during the siege of Paris. At the close of the war he retained his command.

GEORGE, known as PISIDES or Pisida, a Byzantine writer of the 7th c., was, as his surname implies, a native of Pisidia; but of his personal history nothing is known except that he had been ordained a deacon, and that he held, either simultaneously or successively, the offices of "chartophylax," "scenophylax," and "referendarius" in the "Great Church" (that of St. Sophia) at Constantinople. He is also believed to have accompanied the first expedition (622) of the emperor Heraclius against the Persians; at all events, his earliest work, consisting of 1098 iambic trimeter verses, is devoted to such a description of that campaign, as could hardly have come from any other than an eye-witness. This composition was followed by a poem in 541 verses, giving details of a futile attack on Constantinople, made by the Avari in 626, while the emperor was absent, and the Persian army in occupation of Chalcedon; and by a general survey of the exploits, both at home and abroad, of Heraclius down to the final overthrow of Chosroes in 627, which is believed to have been written before the end of 628. In addition to these three works, which have been edited by Bekker, we have, from the pen of George of Pisidia, a poem upon the creation of the world, containing in its present form 1910 trimeter iambic verses; a treatise on the validity of life in 262 verses; a controversial composition against Severus of Antioch, in 731 verses; two short poems upon the resurrection of Christ and upon the temple of the Virgin at Blachernae, respectively, and a prose encomium upon Anastasius the martyr. George of Pisidia is known to have written several other works, which, however, are no longer extant; and there is no suf-

ficient reason for assigning to him the compilation of the *Chronicon Paschale* or the astronomical poem entitled *Empedocles Sphæra*. As a versifier, George is correct and even elegant; as a chronicler of contemporary events, he is exceedingly useful; but the modern verdict on his merits as a poet has not confirmed that of those later Byzantine writers whose enthusiastic admiration led them to compare him with and even refer him to Euripides. Recent criticism is unanimous in characterizing his composition as artificial and almost uniformly dull.

GEORGE of CAPPADOCIA, from 356 to 361 Arian archbishop of Alexandria. He was a native of Epiphania, in Cilicia; but universal tradition makes him a Cappadocian. Gregory Nazianzen tells us that his father was a fuller, and that he himself soon became notorious as a parasite of so mean a type that he would "sell himself for a cake." By his powers of insinuation he succeeded in obtaining a lucrative contract for supplying bacon to the army, but fulfilled its terms so ill that he was soon compelled to abscond, after he had with difficulty escaped death at the hands of the indignant soldiers. After many wanderings, in the course of which he seems to have lived some time at Constantinople and to have amassed a considerable fortune as receiver of taxes, he ultimately reached Alexandria. It is not known when or how he obtained ecclesiastical orders; but after Athanasius had been banished in 356, George was promoted by the influence of the prevalent Arian faction to the vacant see. His persecutions and oppressions of the orthodox ultimately raised a rebellion which compelled him to flee for his life; but his authority was restored, although with difficulty, by a military demonstration. Untaught by experience, he resumed his course of selfish tyranny over Christians and heathen alike, and raised the irritation of the populace to such a pitch that, within a few days after the accession of Julian, they arose *en masse*, dragged him out of prison, where he had been placed by the magistrates for safety, paraded him with every indignity through the streets on a camel, burnt his dead body, and cast the ashes into the sea. With much that was sordid and brutal in his character, George combined a highly cultivated literary taste, and in the course of his chequered career he had found the means of collecting a splendid library, which Julian ordered to be carefully preserved and conveyed to Antioch for his own use.

GEORGE, ENOCH, 1767-1828; b. Va.; a minister and bishop of the Methodist Episcopal church. He began to preach in North Carolina, and made extensive circuits in that state and Virginia, South Carolina, and Georgia, until from physical inability he was compelled to retire. He resumed his work in 1799, and in 1800 took charge of a district extending from the Alleghanies to Chesapeake bay. Again the failure of his health forced him to retire, and again he resumed work. He was chosen bishop in 1816, and filled the office until his death.

GEORGE, LAKE (*ante*), in e. New York near the border of Vermont; about 36 m. long from s. to n., and from 1 to 4 m. wide; generally shallow, but in some places very deep. It merges into lake Champlain on the n. Lake George is one of the most beautiful of the many lakes of the n. Its waters are singularly clear; it is dotted with charming islands, and the scenery of its banks is in the highest degree picturesque. Great historical interest attaches to it in events connected with the old French war and the war of the revolution. The ruins of the famous fort Ticonderoga, taken by Ethan Allen "in the name of Almighty God and the continental congress," are on the stream connecting with two lakes. Lake George was discovered early in the 17th c. by the French missionaries, and father Jogues called it St. Sacrament lake because he arrived there on Corpus Christi day, May 27, 1646. The English named it after George III.

GEORGE, of TREBIZOND, 1396-1486; one of the distinguished writers in the great controversy between Aristotelianism and Platonism in the 15th c., was b. at Chandace in the island of Crete. He received his cognomen apparently from the fact that his ancestors had come from Trebizond. He came to Italy and settled as teacher of philosophy and rhetoric at Venice. His reputation as a teacher and as translator of Aristotle was very great, and he was selected as secretary by pope Nicholas V., an ardent Aristotelian. The needless bitterness of his attacks upon Plato, which drew forth a powerful response from Bessarion, and the manifestly hurried and inaccurate character of his translations, both of Plato and Aristotle, combined to ruin his fame as a scholar, and to endanger his position as teacher of philosophy. The indignation against him, on account of his first-named work, was so great that he would probably have been compelled to leave Italy had not Alphonso V. given him protection at the court of Naples. He died in Rome. Many of his translations of Aristotelian treatises are to be found in the older editions of Aristotle.

GEORGES, MARGUERITE JOSEPHINE, 1787-1867; a French actress of great beauty and genius, who appeared in 1802 as *Clytemnestra*. She played in Dresden before Napoleon and Alexander I., of Russia. She was patronized by Napoleon and Hortense, who introduced her at the Théâtre Français in 1813. Talma was one of her teachers. For many years she was one of the reigning favorites in the principal European cities. Her most acceptable representations were *Semiramis*, *Merope*, *Dido*, *Agrippina*, *Lucrezia Borgia*, *Mary Tudor* and *Catherine de Medici*. When she retired from the stage she was so poor that she was compelled to teach to earn a living.

GEORGETOWN, a co. in e. South Carolina on the sea coast between the Santee and the Great Pedee rivers; 800 sq. m., pop. '80, 19,613—16,152 colored. It has a level and, in some places, a swampy surface. The productions are rice, corn, and cotton. Co. seat, Georgetown.

GEORGETOWN, a t. in Scott co., Ky., on the Cincinnati Southern railroad, 13 m. n. of Lexington; pop., 1570. It is the seat of Georgetown (Baptist) college, founded in 1838. It possesses banks, newspapers, manufacturing establishments, and a female seminary.

GEORGETOWN, the seat of justice in the co. of the same name in South Carolina, on Winyaw bay, near the mouth of Waccamaw river, 14 m. from the sea and 50 m. n.e. of Charleston; pop, 2,557. Its principal trade is in rice, pine timber, and turpentine.

GEORGIA (*ante*); so named in honor of George II.; one of the 13 original states of the American union, lying on the Atlantic between $30\frac{1}{2}^{\circ}$ and 32° n., and running inland up to 35° n., and between 81° and $85\frac{1}{2}^{\circ}$ w. It has the ocean on the e., South Carolina on the n.e., North Carolina and Tennessee on the n., Alabama on the w., and Florida on the s. Length 320 m.; width 245 m.; area 58,000 sq. miles. Nearly all the sea-coast is low and swampy, and indented by sounds, among which are Altamaha, Cumberland, Doboy, Ossabaw, Sapello, Warsaw, and Sts. Andrew, Catherine, and Simon. Between these sounds and the ocean are the large islands of Ossabaw, St. Catherine's, Sapello, St. Simon's, Jekyll, and Cumberland, which are very fertile, and produce, among other things, the valuable sea-island cotton. Some 20 m. from the ocean the land rises abruptly some 75 ft., and at nearly the same distance inland another elevation occurs of equal height, and from it table-land gradually rises until, towards the center of the state, the level is 575 ft. above the sea. Further to the n.w. are gradually increasing hills, in almost parallel ranges, for a distance of some 150 m., finally reaching 2,000 to 4,000 ft. above sea-level. On the east is a range of the Appalachian mountains, and beyond it an undulating surface of hills and valleys extends to the foot of the Blue Ridge, which covers the n.w. portion of the state and rises from 2,000 to 4,000 ft., forming the water-shed of streams flowing to the Atlantic, the Ohio, and the gulf of Mexico. The Savannah is the largest river of Georgia, and is about 450 m. in length, navigable for large vessels to Savannah, 18 m. from the sea, and for steamboats, to Augusta, 230 m. further, whence small steamboats proceed by a canal around the falls, about 150 m. more. This river forms the boundary between Georgia and South Carolina. The Chattahoochee, which is the Alabama boundary, is nearly 600 m. in length, and navigable for 300 m. from the gulf to the falls at Columbus. Flint river, a branch of the Chattahoochee, is navigable to Albany, over 100 m. from its mouth. The Altamaha, falling into the Atlantic near the ocean boundary of Georgia, is navigable for ships to Darien, and for steamboats to its source, and by both branches, the Ocmulgee to Macon, and the Oconee to Milledgeville. The Ogeechee, the Altamaha, and the Savannah and its southern branch, the Cannouchee, admit of sloop navigation. The Santilla and St. Mary's (the latter forming part of the Florida boundary) are also navigable for small craft. Other rivers of Georgia are the Withlacoochee and Allapaha, which unite in Florida and form the Suwanee; the Etowah and Oostenaula, which at Rome form the Coosa; the Tallapoosa, the Tacolah, and the Natley.

In Oct., 1828, a negro slave discovered in the sands of Bear creek, in White county, some grains of gold, but so fine that no attention was given to them until the same negro found in the Nacoochee river sands a nugget worth several thousand dollars. This started a gold-hunting furor. A tradition existed among the frontier settlers of the Cherokee country, which covered about one third of Georgia and part of the adjoining mountain district of western North Carolina, that there was gold there, and that the Indians knew where, for they had sometimes used it for bullets, but were prohibited by Indian laws and a death penalty from discovering the much coveted metal to the white men. The U. S. government was forced to remove the Indians at national expense for the benefit of Georgia, which seized upon the whole Cherokee country and divided it up by lottery in 1833, among all the "free white male population of the state"—the supposed mineral lands in 40-acre lots, and the farming lands in 160-acre lots. As it was impossible to tell at that time what part of the territory contained gold, it was an arbitrary division upon guess-work. On many of the tracts sold as "gold lots" by men who drew prizes in that lottery, and which are even now sometimes sold to strangers in other states, gold has never been found. On the other hand, gold is often found upon farming lands in several counties where it was not at first supposed to exist. White county has been one of the noted mining regions of Georgia for more than 50 years. The work has been done mostly upon a limited scale by citizens of small means, and only with the rudest kind of machinery. Lately, work has been prosecuted in better order by men who understand the business of mining and reducing quartz rock in good stamp mills. The noted Louderville mines and mills are in the southwesterly portion of White county. The next great find of gold after the Nacoochee valley discovery, was on the Chestatee river, at a place that soon became famous as "Leather's Ford," 50 m. from Atlanta. The discovery of gold here was the cause of the historical "intrusion" into the Cherokee country in 1829-30, to prevent which, U. S. troops were sent there; but they created an excitement, brought in ten gold-hunters for every one that

they kept out. Thousands of adventurers rushed thither and held their ground in spite of the efforts of the troops to drive them away. Miners' camps were established at "Knucklesville," now called Auroria, and at Dahlonega, which have seldom been equaled in California or Colorado. This was the beginning (1829) of Georgia gold mining, or rather gold finding, and from this all of the present immense mining interest of the United States has grown up. A branch mint was established at Charlotteville, N. C., and another at Dahlonega, at vast expense, but without profit to the U. S. treasury. The chief deposits are in a belt 15 to 20 m. wide, extending across the state on the eastern slope of the Alleghanies. The production from 1829 to 1849 is estimated at 1,000,000 ounces. The amount of gold deposited in the U. S. mint and branches, from Georgia, to June 30, 1873, was \$7,267,784. Since the discovery of gold in California the annual production has fallen to a comparatively low figure. The mint erected by the United States, soon after the first discovery of gold in Georgia, at an expense of \$80,000, was, after the close of the rebellion, given to the state to be used for an agricultural school, and its costly machinery sold for less than old iron. A very little silver is found in the state, and iron is abundant. In one place a whole mountain of fossiliferous iron ore is parallel with and less than a mile distant from Lookout mountain, in which are extensive beds of coal. There is coal in many other places; copper in one place, and the usual minor minerals, such as antimony, zinc, manganese, etc., but none are extensively worked. There are also deposits of marble, gypsum, talc, asbestos, soapstone, slate, tripoli, petroleum, barytes, hydraulic cement, quartz crystals, beryl, garnet, agate, and so-called diamonds. There are chalybeate springs in the n. part, and sulphurous springs in the center of the state.

The principal fossils are, remains of the mastodon, the megatherium, the mylodon, the elephant, the ox, and of a number of turtles and mollusks. Of living wild animals there are the black and brown bear, panther, wild cat, fox, raccoon, opossum, woodchuck, deer, rabbit, squirrel, and, near the sea, alligators and turtles. The venomous reptiles are the moccasin, rattle, and copper-head snakes; and the low lands are infested with annoying insects, such as sand flies, mosquitoes, and chigoes or jiggers. Among the birds are, the eagle, several species of the hawk, the turkey-buzzard, the sea-gull, and many smaller kinds, of fine plumage and song. Fish of good quality abound in the rivers, and turtle in the ocean and the sounds. The earliest supplies of shad for the northern markets come from the Savannah and Ogeechee rivers. In the higher lands the climate is cool and salubrious; but along the sea-coast it is intensely hot, and malarial diseases are prevalent.

On the alluvial section, near the sea-coast, every variety of tree flourishes, as the live oak, cypress, cedar, palmetto, magnolia, sweet bay, wild orange, cane, and other semi-tropical trees and plants. Further inland, scrub oaks and yellow pine are found. Still further n.w. are large forests, in which the hickory, tulip, chestnut, black walnut, sycamore, maple, poplar, beech, fir, ash, elm, bay, laurel, and spruce flourish. Tropical fruits, such as the orange, banana, lemon, and olive, are grown in the s.e. section; and in the same region are produced abundant crops of sugar-cane, rice, cotton (long and short staple), and sweet potatoes. Here also grow rich grasses for hay and pasturage. The central portion is favorable for the growth of peaches, apples, pears, cherries, melons, and grapes. Cotton is the main crop in this section, though corn, wheat, oats, rye, barley, and clover are cultivated, and tobacco also, to some extent. Peanuts, sweet potatoes, and sorghum yield abundantly. In the mountainous region the soil is generally thin, but it is a good grazing country. The valleys are fertile and favorable for corn, wheat, clover, and northern fruits. The s.e. section of the state is in the great "cotton belt," and sugar-cane, rice, and sweet potatoes are largely raised there. More than one-half of the land surface of the state is still covered with forests. In 1879 there were in the state 2,413 m. of railway track, belonging to 28 different lines. The Alabama Great Southern, from Wauhatchie, Tenn., to Meridian, Miss., 290 m., has 26 m. in Georgia; the Atlanta and Charlotte Air Line, from Atlanta to Charlotte, N. C., 296 m., has 109 m. in Georgia; the Atlanta and West Point, from East Point to West Point, 81 m., is all in the state; the Atlantic and Gulf, from Savannah to Bainbridge, 237 m., comprises, in addition to the Florida Branch, from Dupont, Ga., to Live Oak, Fla., 49 m., and the Albany Branch, from Thomasville to East Albany, 58½ m.; the Augusta and Savannah, from Miller to Augusta, 53 m.; the Brunswick and Albany, from Brunswick to Albany, 172 m.; the Georgia Central, from Savannah to Atlanta, 294 m., with a branch of 17 m. connecting Gordon with Milledgeville; the Cherokee, from Cartersville to Rockmart, 23 m.; The Eastern Tennessee, Virginia and Georgia, from Bristol to Chattanooga, Tenn., has a branch from Cleveland, Tenn., to Dalton, 30 m.; the Eatonton Branch of the Georgia Central, from Milledgeville to Eatonton, 22 m.; the Elberton Air Line, from Tocoa City to Elberton, 50 m.; the Georgia, from Augusta to Atlanta, 171 m., with branches from Union Point to Athens, extending 39 m., and from Barnet to Washington, 17 m., in all 231 m.; the Georgia Southern, from Dalton to the state line, 66 m.; the Macon and Augusta, from Warrenton to Macon, 78 m.; the Macon and Brunswick, from Macon to Brunswick, 187 m., with a branch of 10 m. connecting Cochran with Hawkinsville; the Marietta and North Georgia, from Marietta to Murphy, N. C., 110 m., is completed to Canton a distance of 23 m.; the North Eastern, from Athens to Lula, 40 m.; the North and South Georgia, from Columbus to Rome, 125 m.,

is open from Columbus to Hamilton, 23 m.; the Rome, from Rome to Kingston, 20 m.; the Savannah and Charleston, from Savannah to Charleston, 106 m., has 15½ m. in Georgia; the Savannah, Griffin and North Alabama, from Griffin to Carrollton, 63 m.; the South Western, from Macon to Eufala, 144 m., with branches from Columbus to Fort Valley, 72 m., from Fort Valley to Perry, 13½ m., from Smithville to Albany, 23½ m., from Cuthbert to Arlington, 37 m.; the Upson County, from Barnesville to Thomaston, 163 m.; the Western and Atlantic, from Atlanta to Chattanooga, Tenn., 138 m., of which 121 are in the state, and four or five roads less than 10 m. in length.

The principal towns in Georgia are Savannah, pop. 70, 28,235; Atlanta (the capital), and Macon. There were no others in 1870 having 10,000 inhabitants. The number of organized counties in 1878 was 137. There are but few canals in the state. The tonnage in 1878 was, 76 sailing vessels, 10,184; 24 steamers, 10,124; total, 20,308 tons. The cash value per acre of all crops taken together in 1878, \$8.18. Public debt Jan. 1, 1878, \$10,644,000; raised by tax in 1877, \$1,129,990; rate of tax, 50 cts. on \$100; assessed real estate \$140,153,350, personal \$95,506,280. Area of the state, in acres, 37,120,000.

The school age in Georgia is from 6 to 18; the school population in 1878, 433,444 white, and 197,125 colored; enrolled, 190,626; average attendance, 97,966; income, \$400,000; expenses, \$434,046. The higher institutions are Atlanta university (non-sect.), at Atlanta, to which pupils of both sexes are admitted; Clark university (M. Ep.) at Atlanta, both sexes; Emory college (Meth.) at Oxford; Gainesville male and female college (non-sect.); Mercer university (Bap.), at Macon; Pio Nono college (R. C.) at Macon; university of Georgia (non-sect.) at Athens. In all these institutions there were in 1878, 57 instructors, and 779 students. There are also the Baptist institute at Augusta, with three teachers and 113 students; the state college of agriculture at Athens; an agricultural college at Dahlgonega, (occupying the old U.S. branch mint buildings); an agricultural department in the university of Georgia; two medical colleges at Atlanta, one at Macon, and one at Augusta, and law departments in the state and the Mercer universities. The Atlanta institute provides a theological course for colored students, and provision is made for them in the university at that place. The masonic grand lodge of the state sustains a female college at Covington, with eight instructors and 114 pupils. There were in the state at the beginning of 1878, 155 newspapers and other serial publications; 11 daily, 2 tri-weekly, 3 semi-weekly, 126 weekly, 2 semi-monthly, and 11 monthly. The statute of limitations fixes four years for open accounts, six for notes, and seven for judgments.

In 1732 George II. granted a patent to certain trustees for settling the "colony of Georgia," and the next year gen. James Oglethorpe explored the country, purchased land from the Creek Indians, and laid the foundation of Savannah. Among those interested in the colony were the Wesleys and George Whitefield, the founders of Methodism. When war broke out between England and Spain, gen. Oglethorpe was put in command of the troops of South Carolina and Georgia, and led an unsuccessful expedition against St. Augustine. In 1742 the Spaniards retaliated by sending a fleet up the Altamaha river and made some captures, but were repulsed by Oglethorpe. The growth of the colony was slow, and so much complaint was made of the restrictions as to holding slaves that these were removed, and in 1752, after the surrender of their charter by the trustees, the colony came under the government of England, a governor was appointed, and in 1755 a local legislature was established. At that time the boundaries were the Savannah river on the n., the Altamaha on the s., the Atlantic ocean on the e., and the Pacific ocean on the w. If these boundaries had been continued the state would now embrace nearly the whole of the states of Alabama, Mississippi, half of Arkansas, half of Louisiana, half of Texas, a third of the Indian territory, nearly all of New Mexico and Arizona, and nearly half of California. The s. boundary was extended in 1763 to the St. Marys', the present line of Florida; an annexation which included a large and rich rice and cotton region, and was followed by a rapid growth of the colony. Although more remote from the influences of the home government, and having fewer grievances than any other of the colonies, Georgia was prompt to join the colonies in the projected resistance to British rule. A delegate represented Georgia in the continental congress in 1775, and in a convention held the same year the colony accorded full sanction to revolutionary measures. In 1778 British troops overran the colony, and captured Savannah; Augusta and Sunbury were seized next year. In 1779 the revolutionists made an unsuccessful attempt to recapture Savannah. A state constitution was formed in 1777, another in 1789, and yet another in 1798, which, with some amendments, remained in effect until Georgia joined the southern confederacy. Troubles with the Cherokee and Creek Indians were continuous from the peace with Great Britain until the cession by the Creeks in 1802; of the territory that now forms the s.w. part of the state; and at a later period a difficulty arose between the federal and state governments concerning the Cherokees, which was not settled until that tribe was removed (in 1838) to the new Indian territory w. of Arkansas, the state coming into possession of their original lands.

Georgia was early in the secession, having, on the 18th of Nov., 1860, ordered a convention to be held at the beginning of the Jan. following. On the 19th of that month an ordinance of secession was adopted by a vote of 208 to 89, and signed by all except six of the delegates. Ten members were sent to the confederate congress, and the confederate constitution was adopted by the state, March 16. Laws were enacted to resume

jurisdiction over territory ceded to the United States, and the federal arsenals, forts, and war material were turned over to the confederate government. Fort Pulaski was recaptured in April, 1862, and several seaport towns were occupied. The confederate iron-clad steamer Nashville was destroyed in Ogeechee river early in 1863, and in the same year the iron-clad Atlanta was attacked and disabled. Early in 1864 the state felt the power of the Union arms under gen. Sherman, the confederates being forced to fly from Atlanta Sept. 1. Ten weeks later Sherman began his march to the sea, proceeding directly through the heart of the state. Scouring a district 50 m. wide and ending with the capture of Savannah Dec. 21, the confederates making no attempt at defense, but destroying the navy yard, several vessels, and all military stores. It was near Irwinville in Georgia that the Union cavalry under gen. Wilson captured Jefferson Davis; and it was at Andersonville in Georgia that the confederates had their most notorious military prison. After the final success of the federal arms, Georgia remained under military rule until June, 1865, when a provisional government was established, and in October, delegates were chosen to a state convention, which repealed the secession ordinance and laws, declared the confederate war debt void, amended the state constitution in accordance with the changes in that of the United States, and directed the election of state officers and a legislature. The legislature met Dec. 4, ratified the amendments to the United States constitution, and directed the provisional governor to give place to the one chosen by the state; but this was disapproved by congress, and under the reconstruction acts of 1867 a registration of voters was made (96,262 white and 95,973 colored), and an election held for a new constitutional convention, which consisted of 166 delegates. The whites generally did not vote, and one-fifth of the members of the convention were colored men. A constitution was made in March, 1868, and ratified by vote of the people in April; and on the last day of that month the military government terminated. Subsequently trouble arose in regard to the test oath, and it was not until the 15th of July, 1870, that reconstruction was completed by the president's signing the act for Georgia's re-admission to the Union.

The present constitution gives the suffrage to males 21 years old and over, who are citizens of six months' residence in the state and 30 days in the county, and who have paid such taxes as have been assessed. Defaulters in public funds, and persons convicted of felony or larceny are (unless pardoned), ineligible to office; citizens who engage in duels or abet them can neither vote nor hold office. The senate of 44 members is chosen for four years, half of them retiring every two years. They must be 25 years of age, and two years resident in the state. Representatives (168) are chosen for two years; must be 21 years old, and one year residents of the state. The sessions of the legislature are annual, and limited to 40 days unless extended by a two-thirds vote. Members are paid \$4 per day and mileage. Sectarian appropriations of public money are prohibited; cities and towns cannot be stock-holders in public works unless by vote of their electors. The governor must be 30 years old, have been 15 years a citizen of the Union and six years of the state; continues in office for four years; salary \$4,000. In elections, if no one has a majority of the votes for governor, the legislature must choose between the two having the highest votes. There is no lieutenant governor, the president of the senate filling the office of governor when it becomes vacant. Other state officers are appointed by the governor with the advice and consent of the senate. There is a supreme court with three judges, who hold office 12 years; and the usual inferior courts are provided for. Heads of families have homestead exemption to the value of \$2,000, and exemption of personal property to the value of \$1000, except for taxes, or purchase or improvement of the homestead sought to be exempt. Legal interest is seven per cent., but any amount may be taken upon special agreement, and there is no penalty for usury. Property owned by a woman at the time of marriage, and that inherited, presented, or acquired by her, is her own, and not liable for the husband's debts. Married women have the same rights as single ones in respect to business transactions, and may trade with consent of the husband. The concurrent verdicts of two juries are necessary to effect a complete divorce. Whipping for minor offenses is retained. Treason, arson, murder, rape, and castration are punishable with death. Assignment by a debtor does not discharge his liabilities.

The electoral votes of Georgia for president and vice-president of the United States have been cast as follows:—1789, 5 for Washington for pres., 2 for John Milton of Ga., 1 for James Armstrong of Ga., 1 for Benj. Lincoln of Mass., and 1 for Edward Telfair of Ga. for v. p.; 1792, 4 for Washington and Adams; 1796, 4 for Jefferson and Geo. Clinton; 1800, 4 for Jefferson and Burr; 1804, 6 for Jefferson and Geo. Clinton; 1808, 6 for Madison and Geo. Clinton; 1812, 8 for Madison and Elbridge Gerry; 1816, 8 for Monroe and Dan'l D. Tompkins; 1820, 8 for Monroe and Tompkins; 1824, 9 for Crawford and Van Buren; 1828, 9 for Jackson for pres., and 7 for Wm. Smith of S. C., and 2 for Calhoun for v. p.; 1832, 11 for Jackson and Van Buren; 1836, 11 for Hugh L. White of Tenn. and John Tyler of Va; 1840, 11 for Harrison and Tyler; 1844, 10 for Polk and Dallas; 1848, 10 for Taylor and Fillmore; 1852, 10 for Pierce and King; 1856, 10 for Buchanan and Breckenridge; 1860, 10 for Breckenridge and Lane; 1864, did not vote; 1868, 9 for Seymour and Blair; 1872, 6 for B. Gratz Brown, 2 for C. J. Jenkins of Ga., and 3 not counted for pres., 5 for B. Gratz Brown, 5 for A. H. Colquitt, and 1 for N. P. Banks for v. p.; 1876, 11 for Tilden and Hendricks; 1880, 11 for Hancock and English.

GEORGIAN BAY, an e. extension of lake Huron in the province of Ontario, Canada, about 120 m. long and 50 m. wide. It is separated from the lake by Great Manitoulin island and the peninsula which terminates at Cabot Head.

GEORGIA, UNIVERSITY OF, at Athens, Clarke co., was founded in 1800. It is undenominational. It has an endowment of \$370,000, and an annual income of over \$33,000. Its buildings, which comprise a library, museum, chancellor's office and halls, chapel, a large edifice for chemical, philosophical, and engineering departments, professors' residences, and farm buildings, are valued at \$120,000. The campus embraces 16 and the farm 80 acres. There is philosophical and chemical apparatus, models in engineering, and complete sets of surveying instruments, a cabinet of mineralogy and geology, and a library containing 13,000 volumes. The university embraces five departments—1, academic department (known as the Franklin college); 2, state college department; 3, law department; 4, North Georgia agricultural college (at Dahlonega); 5, medical college (at Augusta). Tuition without payment is given to fifty meritorious students. Candidates for the ministry, of any denomination, are admitted without the payment of tuition fees, upon presenting proper letters from the authorities of the church to which they may be attached. The state college department embraces schools of agriculture, engineering, and applied chemistry. In the academic department (Franklin college) there are (1879) 9 professors; in the state college, 8; in the law school, 5. The total number of students in these departments is 149. Students in the agricultural department, 323; in the medical department, 77. Total, 549.

GEPIDÆ, a people of Germanic origin, in the 3d c. living on the shores of the Baltic near the river Vistula. They were subjected by Attila, but becoming independent after his death, rose and drove out the Huns. They were completely defeated by Theodoric the Ostrogoth king in 488, and when, in 566, they were subjugated by the Avars, who came to the assistance of the Lombard king, they lost all independence and became merged with other races.

GERANDO, DE. See DEGERANDO, *ante*.

GERARD THE BLESSED (Tum, Tunc, Tenque, or Thom), 1040-1120; founder of the order of the knights hospitallers of St. John or of Malta. Whether as a soldier or a merchant, he in the course of the latter part of the 11th c. found his way to Jerusalem, where a hospice had for some time existed for the convenience of those who wished to visit the holy places. Of this institution Gerard became guardian or provost at a date not later than 1100; and here he organized that religious order of St. John which received papal recognition from Pascal II. in 1113, by a bull which was renewed and confirmed by Calixtus II. shortly before the death of Gerard.

GERARD, CÉCILE JULES BASILE, 1817-64; a French traveler better known as "Gerard the Lion-hunter." His adventures in Algeria were chronicled in *La Chasse au Lion*, and *Gerard le tueur des Lions*. In 1863, he started on a tour of exploration in w. Africa, and met his death by drowning, the following year.

GERARD, JEAN IGNACE ISIDORE, 1803-47, a French caricaturist generally known by the pseudonym of Grandville—the professional name of his grandparents, who were actors. He received his first instruction in drawing from his father, a miniature painter, and at the age of twenty-one went to Paris, where he soon afterwards published a collection of lithographs entitled *Les Tribulations de la petite propriété*. He followed this by *Les plaisirs de tout âge*, and *La sibylle des salons*; but the work which first established his fame was *Métamorphoses du jour*, published in 1828, a series of 70 scenes in which individuals with the bodies of men and faces of animals are made to play a human comedy. These drawings are remarkable for the extraordinary skill with which human characteristics are represented in animal features. The success of this work led to his being engaged as artistic contributor to various periodicals such as *La Silhouette*, *L'Artiste*, *La Caricature*, *Le Charivari*; and his political caricatures, which were characterized by marvelous versatility of satirical humor, soon came to enjoy a general popularity which never diminished. Besides supplying illustrations for various standard works, such as the songs of Beranger, the fables of La Fontaine, *Don Quixote*, *Gulliver's Travels*, *Robinson Crusoe*, he also continued the issue of various lithographic collections, among which may be mentioned *La vie privée et publique des animaux*, *Les cent proverbes*, *L'autre monde*, and *Les fleurs animées*. Though the designs of Gerard are occasionally unnatural and absurd, they usually display keen analysis of character and marvelous inventive ingenuity, and his humor is always tempered and refined by delicacy of sentiment and a vein of sober thoughtfulness.

GERARD, JOHN, 1545-1608, herbalist and surgeon. He was educated at Wisterson, and after spending some time in traveling, took up his abode in London, where he exercised his profession. For more than twenty years he also acted as superintendent of the gardens of lord Burghley, secretary of state to queen Elizabeth. In 1596, he published a catalogue of plants cultivated in his own garden, 1039 in number, inclusive of varieties of the same species. Their English as well as their Latin names are given in a revised edition of the catalogue issued in 1599. In 1597, appeared Gerard's well-known *Herball*, described by him in its preface as "the first fruits of these mine own labors," but more truly an adaptation of the *Stirpium historie pemptales* of Rembert Dodoens,

published in 1583, or rather of a translation of the whole or part of the same by Dr. Priest, with L'Obel's arrangement. Of the numerous illustrations of the *Herball* sixteen appear to be original, the remainder are mostly impressions from the wood-blocks employed by Jacob Theodorus (Tabernaemontanus) in his *Icones Stirpium*, published at Frankfort in 1590. A second edition of the *Herball*, with considerable improvements and additions, was brought out by Thomas Johnson in 1633, and reprinted in 1636. Gerard was elected a member of the court of assistants of the barber-surgeons in 1595, by which company he was appointed an examiner in 1598, junior warden in 1605, and master in 1608.

GERARDMER, GEROME, or GEROMIEX, a t. in Vosges department, France, near the German frontier; pop. 2,331. It has a large trade in the well-known Gerome cheese. Near by is a beautiful lake through which runs the Valonge river.

GERBERT, MARTIN, 1720-93, a Roman Catholic prelate and writer on church music, and a descendant of the Gerberts of Hornau. He received his education at the Jewish school of Freiburg in the Breisgau, at Klingenan in Switzerland, and at the monastery of St. Blaise in the Black Forest. He joined the order of the Benedictines in the monastery of St. Blaise in 1736, became priest in 1744, was soon thereafter appointed professor of theology, and was chosen abbot in 1764. From 1759 to 1762 he traveled in Germany, Italy, and France, chiefly with a view of obtaining access to the old collections of musical literature contained in the libraries of the monasteries. In 1774, he published two volumes, *De cantu et musica sacra*; in 1777, *Monumenta veteris liturgie Alemannice*; and in 1784, in three volumes, *Scriptores ecclesiastici de musica sacra*, a collection of the principal writers on church music from the 3d c. till the invention of printing. Although this work contains many textual errors, its publication has nevertheless been of very great importance for the history of music, by preserving writings which otherwise might either have perished or remained unknown. He is also the author of *Codex epistolaris Rudolphi I.*, 1772, and *Historia Nigre Silve*, Cologne, 1783-88. His interest in music led to his acquaintance with the composer Gluck, who became his intimate friend.

GERBIL, a genus of rodents much like rats, in Africa, Asia, and Europe. They live under ground and store grain for food in their burrows. They are of fawn color, very lively, and emit an offensive odor.

GERBOA. See JERBOA, *ante*.

GERFALCON, or JERFALCON. See GYT-falcon, *ante*.

GERHARD, FREDERICK WILLIAM EDOUARD, 1795-1867; a German archaeologist. After studying at Breslau and Berlin, he, in 1816, took up his residence at the former town. The reputation he acquired by his *Lectiones Appollonianae*, published in the same year, led soon afterwards to his being appointed professor at the gymnasium of Posen. On resigning that office in 1819, on account of weakness in the eyes, he traveled in Italy, and in 1822, he took up his residence in Rome, where, with a view of prosecuting his archaeological studies, he remained for fifteen years. He there contributed to Platner's *Beschreibung der Stadt Rom*, then under the direction of the *Istituto di corrispondenza archeologica*, founded at Rome in 1828, and during his stay in Italy, was its director. After his return to Germany in 1837, he was appointed archaeologist at the royal museum of Berlin, and in 1844, was chosen a member of the academy of sciences, and a professor in the university.

GERHARD, JOHANN, 1582-1637; one of the ablest and most learned exponents of Lutheran orthodoxy. In his fifteenth year he came under the personal influence of Johann Arndt, author of *Das Wahre Christenthum*, and resolved to study for the church. Soon after entering the university of Wittenberg, however, in 1599, he began to waver in this determination, and ultimately gave himself for two years to the study of medicine, but in 1603 resumed his theological reading at Jena, and in the following year received a new impulse from Winkelmann and Mentzer, at Marburg. Having graduated and commenced giving lectures at Jena in 1605, he, in 1606, received and accepted the duke of Coburg's invitation to the superintendency of Heldburg and mastership of the gymnasium; soon afterwards he became general superintendent of the duchy, in which capacity he was much and usefully engaged in the practical work of ecclesiastical organization until 1616, when he found a more congenial sphere in the senior theological chair at Jena, where the remainder of his life was spent. Though still comparatively young, Gerhard had already come to be regarded as the greatest living theologian of Protestant Germany; in the numerous "disputations" which characterized that period he was always protagonist, while on all public and domestic questions touching religion or morals, his advice was eagerly sought on all hands and by every class. It is recorded that during the course of his lifetime he received repeated calls to almost every university in Germany, as well as to Upsala, in Sweden.

GERHARDT, PAUL, 1606-76, the greatest hymn-writer of Germany, if not of Europe, was b. of a middle-class family at Grafenhainichen. His education appears to have been retarded by the troubles of the period, the thirty years' war having begun about the time he reached his twelfth year. After completing his studies for the church, he is known to have lived some years at Berlin as tutor in the family of an advocate named Berthold, whose daughter he subsequently married, on receiving his first ecclesiastical

appointment at Mittelwald in 1651. In 1657, he accepted an invitation as "diaconus" to the Nicolaikirche of Berlin; but in consequence of his uncompromising Lutheranism in refusing to accept the elector Frederick William's "syncretistic" edict of 1664, he was deprived in 1666. Though absolved from submission and restored to office early in the following year, on the petition of the citizens, his conscience did not allow him to retain a post, which, as it appeared to him, could only be held on condition of at least a tacit repudiation of the Formula Concordiæ, and for upwards of a year he lived in Berlin without fixed employment. In 1668, he was appointed archdeacon of Lübben in the duchy of Saxe-Merseburg, where, after a somewhat somber ministry of eight years, he died on June 7, 1676. Many of his best known hymns were originally published in various church hymn-books, as for example in that for Brandenburg which appeared in 1658; others first saw the light in Johann Crüger's *Geistliche Kirchenmelodien* (1649) and *Praxis Pictatis Melica* (1656).

GERICAULT, JEAN LOUIS ANDRÉ THÉODORE, 1791-1824, a French painter who led the reaction which set in under the empire against the fixed and frigid classicities of the school of David. In 1808, he entered the studio of Charles Vernet, from which, in 1810, he passed to that of Guérin, whom he drove to despair by his passion for Rubens, and by the unorthodox manner in which he persisted in interpreting nature. At the salon of 1802, Géricault attracted attention by his "Officier de Chasseurs à Cheval," a work in which he personified the cavalry in its hour of triumph, and turned to account the solid training received from Guérin in rendering a picturesque point of view, which was in itself a protest against the cherished convictions of the pseudo-classical school. Two years later he re-exhibited this work accompanied with the reverse picture "Le Cuirassier Blessé," and in both subjects called attention to the interests of modern aspects of life, treated neglected types of living form, and exhibited that mastery of and delight in the horse which was a prominent feature of his character. Disconcerted by the tempest of contradictory opinion which arose over these two pictures, Géricault gave way to his enthusiasm for horses and soldiers, and enrolled himself in the *mousquetaires*. During the hundred days he followed the king to Bethune, but, on his regiment being disbanded, eagerly returned to his profession, left France for Italy in 1816, and at Rome nobly illustrated his favorite animal by his great painting "Course des Chevaux Libres." Returning to Paris, Géricault exhibited at the salon of 1819, the "Radeau de la Méduse," a subject which not only enabled him to prove his zealous and scientific study of the human form, but contained those elements of the heroic and pathetic, as existing in situations of modern life, to which he had appealed in his earliest productions. Easily depressed or elated, Géricault took to heart the hostility which this work excited, and passed nearly two years in London, where the "Radeau" was exhibited with success, and where he executed many series of admirable lithographs. At the close of 1822, he was again in Paris, and produced a great quantity of projects for vast compositions, models in wax, and a horse *écorché*, as preliminary to the production of an equestrian statue. His health was now completely undermined by his excesses and on Jan. 26, he died.

GERLACH, ERNEST LUDWIG VON, b. Berlin, 1795; an ultra conservative politician of Germany, the leader of the Prussian high-church party. He is also a prominent journalist.

GERLACH, OTTO VON, 1801-49; a German theologian who held many ecclesiastical offices, and was professor in Berlin. He was the author of a number of works, among which are commentaries on the Scripture. He also edited Luther's writings.

GERM. See EMBRYO, *ante*.

GERMAINE, LORD GEORGE, 1716-85; an English statesman known as viscount Sackville. He was the son of the duke of Dorset, and served creditably in the army in Germany. He was a member of parliament in 1761, and colonial secretary of state through the American revolutionary war, and was at all times a determined supporter of English policy.

GERMAN IVY, a clinging plant often seen in parlor or garden culture, indigenous to southern Africa. It sometimes bears yellow flowers, and the stems grow 8 or 10 ft. high. It is well adapted to window culture.

GERMAN REFORMED CHURCH. See REFORMED CHURCH IN THE UNITED STATES.

GERMAN SCALE IN MUSIC. This scale of the natural notes is A, H, C, D, E, F, G; not A, B, C, etc. The B is always reserved for B flat, and its place is supplied by substituting the letter H.

GERMAN SEVENTH DAY BAPTISTS. See BAPTISTS, SEVENTH DAY GERMAN.

GERMAN THEOLOGY. I. *Its new life*. At the period of the reformation in Germany, the spiritual life imparted through the instrumentality of the inspired word, produced a reconstruction of theological doctrine as well as of religious institutions and of moral practice. Belief in the Scriptures was no longer demanded on the authority of the church; her voice did not announce the canon or impose the interpretation. But the authority of the Scriptures as the rule of faith was acknowledged, because their doctrine of salvation by faith in Christ—which is their central life—manifested to the soul.

their divine power. "Christ is the emperor over the Scriptures; a writing that does not urge Christ cannot claim canonical authority." Faith, thus receiving the Scriptures as its rule, came out from the vast, imposing, and powerful system which had been consolidated as the Christianity of the middle ages, and essayed to re-establish the teachings of Christ, and of his apostles in his name. These teachings, as apprehended by the faith of the German Protestants, found expression in the Augsburg confession and apology, in Luther's catechisms, and the Schmalkald articles. In these, justification by faith is the center around which the system of doctrines is arranged, and from which they all derive their life.

II. *Its formal orthodoxy.* Following the reformation came a period of thought and struggle for the preservation and development of the doctrines received. The power of faith was exerted and tasked in the bloody conflicts which ensued on the reaction produced chiefly through the hidden agency of the Jesuits. The proofs of the truth of the reformation presented in the Scriptures and by the history of the church, had to be searched out and exhibited to view. The presentation and defense of doctrine, consequently, engrossed the attention of writers and preachers. At first this toil and conflict were far from being deficient in spiritual life. But the power spent in the conflict was not adequately sustained by new supplies; and the very effort to make the outward defenses strong, diminished the sense of dependence on the inward life. Consequently the inward life declined, and, with the decline, the whole system was changed. Justification by faith, although it was the central principle in which the life of the whole was contained, was regarded at length only as one of many doctrines, all of which seemed weak and ready to die. Orthodox theology, with all its apparent defenses, became like a massive citadel which, although it could not be stormed, might easily be taken while the defenders within were either dead or dying.

III. *Its season of pietistic revival.* This state of things was interrupted by a remarkable revival of practical religion which spread over Germany. It was commenced through the instrumentality of John Arndt, who (1605-1609) published, in four volumes, *True Christianity*—a book intended to arouse persons of all classes, but especially ministers and students, to practical and heartfelt religion, as well as to purify the corrupt morals of the age. It produced a powerful impression. No book on practical religion has been more widely diffused; not even (it is affirmed) the *Pilgrim's Progress* or the *Saint's Rest*. Its revivalism also awakened the opposition of the rigid and formal theologians. The movement thus commenced was greatly advanced by Spener (1635-1705). One of his pupils was A. H. Francke; Paul Gerhard also belonged to the party. They established religious meetings called "colleges of piety." This name led to the movement being called pietism. It spread rapidly through Germany, and, at first, without excitement or opposition. But as the effect increased, popular agitation was awakened and violent tumults arose which, beginning in Leipsic, extended through the Lutheran churches in the different states of Europe. And from this time, in all cities, towns, and villages where Lutheranism was established, there appeared suddenly persons, of various ranks and of both sexes, who declared that it was their mission to uproot iniquity, spread true religion through the world, and impart to the church of Christ wiser rules than those which then prevailed. In their writings, in public discourses, and private conversations they explained the means necessary for accomplishing their plans, which they proposed to do without introducing any change into the doctrine, discipline, or government of the Lutheran church. The university of Halle, founded by the friends of pietism, became its home and center. The orphan house, established in that city by Francke, was one of its most efficient instrumentalities, because a living proof that it was able, not only to resist religious error, but also to supply the gravest wants of life. During the 30 years after the university was founded, it educated 6,000 theologians. Its oriental college prosecuted diligently the study of the biblical languages, and sent out missions to Mohammedans and Jews. From Halle the new life was diffused over Europe. The larger cities showed signs of reviving faith, and even the universities which, at first, had violently opposed the movement, became its friends. Pietism was extended into Württemberg and the university of Tübingen by the labors of Bengel, and into Moravia by those of Zinzendorf; Zurich, Basle, Berne, and many other large towns admitted it. It went as far e. as the Baltic and as far n. as Norway and Sweden. Many of the continental courts were influenced by it. Orphan houses like Francke's became fashionable. The reformed church was awakened; England and the Netherlands received the new movement with joy. Tholuck declares that "the Protestant church of Germany has never possessed so many zealous Christian ministers and laymen as in the first 40 years of the 18th century."

IV. *The inroad of rationalism.* 1. *Its incipient advance.*—In the next generation, the fervor of pietism had abated. The diligent study of scriptural truth was exchanged for passive assent to it. Spener had endeavored to unite reason and faith, but his followers, renouncing reason, clung to faith alone. In this way pietism unintentionally, but really, exerted an influence against the orthodox system of doctrines by attaching great importance to the Bible alone as opposed to creeds, and to the witness of the spirit as opposed to the written word. Zeidler, an eminent minister at Leipsic, honoring the Bible, treated systems of doctrine with contempt. Some fervent mystics, in their zeal for the "inner word," spoke lightly of inspiration and atonement. Some insisted sim-

ply on Christian love and morality, heedless of danger from the assaults of false teachers. Koch (1754) lamented the low esteem into which the Bible had fallen among all classes of society. This pressure against orthodox doctrine at home was strengthened by influences coming from England and Holland, the force of which may be estimated by the opposition at first made to it, as indicated by the fact that, within 40 years, nearly 90 works were published against various phases of unbelief. 2. *The period of historical criticism.*—At the middle of the 18th c. German theology was in a rigid and shallow condition. The contest between pietism and formal orthodoxy had ceased. The second generation of professors at Halle had gone. The old defenders of orthodoxy had disappeared. Many of the preachers were engaged in collecting curiosities, stamps, and old coins. Just then the era of historical criticism was ushered in. New investigations were begun; antiquity, literature, science, were diligently explored; the circle of religious beliefs was thrown open for re-examination. Many of the results assumed to have been reached had afterwards to be abandoned; hers of are now admitted and accepted by all parties. On this field also, English deists had already been at work. Toland, Collins, Tyndall, Bolingbroke, had attacked the authenticity of the canon, insisting that the apocryphal books threw doubt also on the others; that many passages in the gospel were spurious; that the time at which the canon was settled is unknown; that the genuine sacred books of the Jews had perished during the exile. Hobbes assigned reasons for rejecting the Pentateuch; Morgan presented the views of Toland and Bolingbroke in an attractive style; Collius assails the prophecies, asserting that only in Daniel are there real predictions, and strangely adding that even these 'were written after the events.' In Germany, Semler of Halle led the advance, obscuring with mist the old orthodox landmarks, assailing the text of the Bible, denying the relevancy of standard proof-texts, disputing the genuineness of many biblical books, and undermining usages and doctrines which, hitherto, all had received. The vigor of critical examination, thus awakened, spread rapidly among the universities and the clergy. It was employed on biblical criticism and exegesis, church history, and the history of doctrine. The authority of the church Semler, indeed, held fast, but in a singular manner, affirming that the symbols and forms are useful in preserving external unity and uniformity. His great error was in supposing that religion could exist without a doctrinal foundation. Beginning with the warmth of pietism around him, he gradually abandoned all reverence for the Scriptures. Regarding the inner conviction of a truth-loving human heart as the only test of the inspiration of a book, he rejected Ruth, Ezra, Nehemiah, Esther, and the Canticles; questioned the genuineness of Joshua, Judges, Samuel, Kings, and Daniel; and slighted the Pentateuch as a collection of legendary fragments. The New Testament, he thought, was better than the Old, yet some of its parts he condemned as positively evil. The Apocalypse he rejected as the work of a fanatic; the Gospel of John he distinguished as the only one *useful* for the modern church. He asserted that Christ and the apostles taught many things in mere accommodation to the prejudices of the age. The doctrines of the Bible Semler vigorously attacked. One after another of the most important seemed, for a time, to be overwhelmed by his stroke. And what he did at Halle, other bold men did in different parts of Germany. Two writers, especially, carried out their principles both in their books and in their lives. Edelmann constructed his theological system in answer to the question—*not what is true, but what is useful?*—that is, what is seen to be useful? Consequently, beginning with very slight departures from orthodoxy, he reduced Christianity, at last, to a weak form of deism. "The reality of everything which exists is God. The world may be called the body of God, the shadow of God, the son of God. The spirit of God is in all that exists. It is foolish to ascribe inspiration to special persons only; every one ought to be a Christ, a prophet, an inspired man." Bahrdt went much further, ridiculing the Bible, blaspheming Christ, and, by his immoral life, making the very name of theologian infamous. Yet he stands as the turning-point of vulgar rationalism. It had become manifest that criticism, if left to itself, would produce only destruction. And this compelled the search for something that would avert the fall. At the opening of the 19th c., the Scriptures, rationally interpreted, were still regarded as teaching a rational religion. But as the historical exegesis had advanced, the chasm had widened between the traditional and the rational sense. The accommodation theory was increasingly applied to every portion of the Bible, and, at length, the mythical theory began to appear. Baur, in 1800, published a Hebrew mythology of the Old and New Testaments, in which the miracles were explained away as merely natural events. 3. *The connection of rationalism with philosophy.*—The work of preparation for rationalism had at first been prompted by the demands of what was called "the sound human understanding;" but after the opening of the 18th c., the aid of philosophy also was sought. Leibnitz's distinction between doctrines which can be rationally proved and those which are above reason was used to cast suspicion on the latter class. Wolff proposed a division of theology into natural and revealed; and, as natural theology could give the reason for the facts which it affirmed, and revealed could not, emphasis was put chiefly on the former. After the decline of Wolff's popularity, the criticism of Semler and his followers seemed harmonious enough with the eclectic system which, for a time, prevailed; for both the criticism and the philosophy were in accordance with the demands of "the sound human understanding." But Kant's philosophy assailed

both. Some of the rationalists, indeed, claimed it as favorable to them; others slighted it as unintelligible; but a few more discerning men saw that the new would overturn the old. When the speculative systems of Fichte and Schelling appeared, they despised the reasonings of "the sound human understanding," and slighted the best principles of rationalism as commonplace and vulgar. And rationalism, on its part, shrinking back from the new atheism, wrote strongly against it. In the faith-philosophy of Jacobi the rationalists thought they could find refuge. Their scheme, hitherto, had allowed no scope to sentiment and the heart. A mere probability was its highest word for the essential truths. The system of Jacobi met this difficulty, since to the intellectual probability it added the certainty of feeling. Therefore the better class of rationalists welcomed it. With this rose also the supernaturalist school, including those who denied the absolute rule of reason in matters of religion; and, though many of them were deficient in reverence for the Bible, they were, at least, travelers in an upward path. Hegel and his followers professed to furnish "an equivalent for the objects of Christian faith and the propositions of Christian theology in the dogmas of their system. The latter were said to be the pure and final rendering of that which Christianity presents in a popular form. The trinity, the atonement, and the other doctrines of the orthodox creed had now—it was asserted—received a philosophical vindication, and the vulgar rationalism, which had flippantly impugned these high mysteries, was at length laid low." This high claim, Strauss, in his life of Jesus, utterly denied. Treating the gospels as a narrative of merely natural events, he asserted that Jesus, a devout man, impelled, like other Jews, by the preaching of John the Baptist, made confession of sin and was baptized. Afterwards, proclaiming himself as the promised Messiah, by his courage, activity, and purity of life, he won the good opinion of many, especially of the common people, and attached to himself a company of devoted disciples; but having, by his scathing rebukes of hypocrisy, kindled the enmity of the priests and Pharisees, he was, by their influence, put to death on the cross. The wonderful works of beneficence and power, with which the narrative was adorned, were only fanciful inventions of his disciples, which ultimately came to be regarded as facts. This historical Jesus, Strauss strove to transform into an ideal character, and affirmed that the God-man is to be looked for not in any one person, but in the human race as a whole. At a later period he was driven to admit, for a time, that the life of Jesus was extraordinary; that Jesus himself had controlling power over the minds of men, and perhaps over physical disease; that "in him must be recognized the highest that can be known or thought in religious things; that without him present in the mind no complete piety is possible, so that the substance of Christianity is in him preserved to us." But these admissions he again withdrew, regretting that in making them he had nicked his sword.

V. *Return to evangelical doctrine.* As the way for the prevalence of rationalism had been opened through the decline of practical religion, so the return to evangelical doctrine was effected by a revival of personal piety, the central line of which can be traced in the lives and work of a series of eminent men. While Semler was striving to disintegrate faith in the Scriptures, as well as the Scriptures themselves, Klopstock wrote and published his *Messiah*, which was spread over every part of Germany and among all classes, awakening admiration, kindling devotion, and drawing the hearts of thousands to the person of the Redeemer. About the same time, Hamann, a young German, after vainly seeking relief in folly and vice from the effects of disappointment, retired to a remote part of London, obtained a Bible and read it carefully. His mind was enlightened to see his past life in its true character and he entered at once on a new course. His writings and genius soon procured him friends in his own country, and gave him influence over the noble, the gifted, and the rich, by which they, as well as men of humbler life, were won to the Christian faith. Herder, contemporary with both Klopstock and Hamann, in his *Spirit of Hebrew Poetry*, gave attention particularly to the literary and human elements of the Bible as, in his opinion, strengthening its claims to a divine origin. He pointed out, critically, its poetical beauties, not as if they were ornaments only, but as springing from the heart of the revelation and forming an essential accompaniment of inspiration. He wrote also on the New Testament, treating of the Pentecostal gift of tongues, the resurrection, the Redeemer in the three gospels, the Son of God as the Savior of the world, and the spirit of Christianity. While imparting elevated views of the Scriptures, he labored also to exalt the pastor, considering that his true place was by the side of the old prophets and that no man was worthy of the office who neglected the particular care of souls. He was himself, in many respects, a model preacher. "When he began to speak every sound was hushed and each curious glance fixed on him; all hearts opened themselves, tears filled every eye, and sighs escaped from every breast." While the three distinguished men above mentioned were in the midst of their active work, Schleiermacher was born, who has been called the greatest divine of the 19th c., and to whose influence for good, scarcely any limit can be assigned. In his 15th year he was sent to a Moravian school, whence he brought a personal devotion to Christ which guided him through life and sustained him in death. His *discourses* to unbelievers of cultivated minds, published in 1799, marked at once the opening of a new century and of a new era in religion. "To him religion was the feeling of an absolute dependence on God, a consciousness of sin, and of the redemption by Christ. All philosophical terms and definitions, all physical investigations, all theses whatever

that could not be derived by strict inference from the profound feeling of sinfulness and the certainty of redemption were excluded from his system of doctrines." In 1789, David Mendel was born of poor Jewish parents, his father a peddler, his mother an intelligent and pious woman. At Hamburg he was assisted in acquiring an education, and soon won the respect of teachers and scholars by his talents, while he excited also their merriment, by the oddity of his appearance and the awkwardness of his manner. When Schleiermacher's *Discourses* were published, he was one of the multitudes awakened by them, and in 1806, renouncing Judaism, he was baptized and took the name Neander (a new man). He studied theology at Halle, where Schleiermacher was his favorite professor and deeply interested friend. In 1812 both teacher and pupil were made professors in the new university at Berlin, the former, of theology, the latter of church history. In this position Neander worked to the end of his life and acquired, as a lecturer, vast renown. Even Schleiermacher's hearers were limited in number when compared with the crowds that came from all parts of Germany, and the most distant Protestant countries, to hear Neander. Many Roman Catholics also were found in his classes. All the great preachers of Germany became more or less enlightened by his ideas. His salutary influence on the religious condition of the country was immeasurably great, powerfully contributing to the overthrow both of rationalism and of dead formalism, and drawing multitudes of young men to embrace the vital doctrines of Christianity. With him religion was nothing without Christ—Christ not only apprehended by the intellect, but also loved and trusted with all the powers of the soul. In his view sin was not only injurious, but also involved guilt, and could be pardoned only through the death and mediation of Christ. In 1816 Tholuck entered the university of Berlin where he was rescued from scepticism under the instructions of Schleiermacher and Neander, aided by the influence of a distinguished Moravian friend. During serious illness the ardor of his love to Christ was kindled and he adopted Zinzendorf's motto—"I have but one passion—that is He, and He alone." In 1826 he became professor of theology at Halle as the successor of prof. Knapp who had sincerely but timidly resisted the prevalent rationalism. Out of 900 students only five avowed their belief in the divinity of Christ; and all the professors, being rationalists, opposed Tholuck's appointment. But the number of young believers in Christ increased year by year. Tholuck, at first alone among his colleagues, won the field for Christ; and they all, one by one, came over to his side. Many thousands of young men became Christians under his instructions. And, among the honored instruments by whom Germany has been turned from rationalism to Christian faith, Tholuck will ever hold an eminent place. Hengstenberg, born 1802, devoted his youth chiefly to the study of philosophy and the oriental languages; but, during a season of sickness and sorrow, having turned with great ardor to the spiritual teaching of the Bible, he became fully convinced of the divine authority of evangelical religion and of the excellence with which its truths are expressed in the Augsburg confession. In 1826, he was made one of the professors of theology at Berlin, and, from that time, for more than 40 years, was a conspicuous and earnest defender of Christian doctrine, as based on the divine authority of the Scriptures. Among his numerous writings may be mentioned, as having especial influence: *Egypt and the Books of Moses*; *Commentary on the Psalms*; and *The Christology of the Old Testament*.

In recent years, the political discussions in Germany have tended to produce in the public mind, especially of the common people, a theological indifference unfavorable to evangelical faith. The rising opposition to an ecclesiastical government works temporarily to the disfavor of the Christian doctrines which, as sustained by the national church, are, in the view of many, identified with it.

GERMANTOWN, a suburb of Philadelphia, since 1854 included within the 22d ward of the city; pop. of the ward, '70, 22,605. It was laid out, under a grant from William Penn, in 1684, and at first, as its name indicates, settled by Germans, its center being about 6 m. from the state house, in a n.w. direction. During the war of the revolution, Oct. 3-4, 1777, Washington made a forced march all night, and surprised a part of the army of the British gen., Howe, which was encamped across the Germantown street. The surprise was complete, as the Americans entered the town about sunrise, and were concealed by the early fog; but they were themselves thrown into confusion by the many small inclosures of the village, and, being seized with panic, fled, carrying away their artillery, but suffering a loss of about 1,000 men. The British loss was about 600. The main street, extending n.w. from the city, is now built up for a distance of about 4 m., and is intersected by many other streets. Germantown contains 21 churches, a number of high and other schools, a bank, and several extensive manufactories. It is the residence of many wealthy citizens, and is lighted with gas, and well supplied with water, and connected with the city by horse and steam railways.

GERMANUS, SAINT, 380-449; b. in (Auxerre) Gaul, of an eminent family; learned in literature and law and distinguished for eloquence. He was military governor of his native district, afterwards bishop of Auxerre. Being chosen bishop, he separated from his wife, built a monastery, and devoted his spare property to the poor. He visited England twice, and on one occasion led the Britons against a plundering party of Picts and Scots, terrifying them into a retreat by shouting "Hallelujah," from which circum-

stance the event was called the "Hallelujah Victory." He encouraged St. Patrick to undertake the conversion of the Irish. His feast occurs on July 31. Three or four lives of St. Germanus have been published.

GERMAN WINES. The culture of the vine is almost confined to southern and western Germany, and especially to the Rhine district. The northern limits of its growth extend from Bonn in a north-easterly direction, through Cassel to the southern foot of the Harz, crossing 52° n. lat. on the Elbe, running then e. some m. to the n. of that parallel, and finally turning sharply towards the s.w. on the Warthe. In the valley of the Saale and Elbe (near Dresden), and in Lower Silesia (between Guben and Grünberg) the number of vineyards is small, and the wines of inferior quality; but along the Rhine, from Basel to Coblenz, in Alsace, Baden, the Palatinate and Hesse, and above all, in the province of Nassau the lower slopes of the hills are literally covered with vines. Here are produced the celebrated Rudesheimer, Hochheimer, and Johannisberger. The vines of the lower Main, particularly those of Würzburg, are the best kinds; those of the upper Main and the valley of the Neckar are rather inferior. The Moselle wines are lighter and more acid than those of the Rhine. The total amount produced in Germany is estimated at 1000 million gallons—Alsace-Lorraine turning out 400 millions, Baden 175, Bavaria, Wurtemberg, and Hesse, together, 300, while the remainder, which, though smaller in quantity, is in quality the best, is produced by Prussia.

The wines of Alsatia are similar to those of the Palatinate; they are white and the principal vines are the Riesling, Traminer, Burger, or Elbing, and Grosser Räuschling. The Sylvaner and Ruländer are also to be found, but peculiar to the district is the Knipperle which fills the vineyards of Thann, Rickweiler, and Ribweiler. The vines produced are consumed in the district, and in the adjoining parts of Switzerland. They were formerly added to Rhenish products of the lower districts to make them milder, but now the reverse obtains. The vineyards of Gebweiler, Türkheim, Rickweiler, Ribweiler, Thann, Bergholtzell, Ruffach, Pfaffenheim, and others yield dry white wines of very good quality, ranking in the second class. The best liqueur wines are made at Colmar, Kaisersberg, Olweiler, Ammerschwyr, Kiensheim, and a few other places. The vinicultural districts of the Palatinate are situated at the foot of a mountain called the Haardt which is the continuation towards the n. of the Vosges. The 70,000 fuder (a fuder=246½ gallons) of wine which are produced in this district, form about one-tenth of the total production of wine in the south of Germany, and it is celebrated for its medium good quality, the purity and freshness of its taste, and the extreme relative lowness of its price. The mode of training the vine here is that called the "double-chamber cultivation," and extends from Landau to Maikammer. The prevailing vines are the Gutedel, Traminer, Sylvaner, and the Riesling. The superior quality of wines are Rupertsberger, Deidesheimer, Wachenheimer, and Forster; Ungsteiner, Dürkheimer, and Königsbach, belong to the second class. The wines and vines of Rhenish Hesse are similar to those of the Palatinate. Liebfraumlisch, a Riesling wine of fine bouquet, is produced in one of the vineyards of Worms. The district of Oberingelheim produces much red wine of the second and third class from Burgundy grapes, and furnishes considerable quantities for the production of *mousseux*, particularly to a celebrated manufactory at Rudesheim. The district of Bingen is distinguished by the growths of Scharlachberg and Feuerberg. The wines of Laubenheim, Guntersblum, Nierstein, and Selzen possess individual reputations, and are often substituted for wines of the Rheingau. The country anciently called Franconia, which is now comprehended under the name of the lower circle of the Main of Bavaria, contains about 70,000 Bavarian tagwerke of vineyards, equal to 58,912 acres. Only a small quantity is exported, and that is grown in the neighborhood of Würzburg. The best vineyards are the Leiste, Stein, Middle Stein, the Harp and Schalksberg, and the wines in good years have a particular strength.

Württemberg and Baden produce considerable quantities of wine, but as its quality is rarely above the fourth class, none is exported. The area of the vineyards is 51,532. Baden morgen, 45,848 acres; the quantity of wine produced annually exceeds 500,000 ohms; its value is estimated to vary between seven and eleven millions of florins. Growths of reputation are the white Markgräfler, and the Affenthaler, a light, agreeable red wine. The area of the vineyards of Württemberg is 54,600 Morgen—42,528 acres, of which more than half are situated in the valley of the Neckar. The average money value of the annual product is only three and a half millions of florins. Much of the wine has a pale red color, and hence is termed "schiller." Hesse, n. of the Main, produces wine in the valley of the Kintzig, from Hanau to Gelnhausen.

The country between the Taunus mountains on the n., and the river Rhine on the s. is generally known as the Rheingau. Its eastern terminus is near Schierstein and Walluf, a short distance below Mayence; its greatest width from n. to s., amounting to 3 m., is at Steinberg and Hallgarten, and its western termination is at the Wisper, below Assmannshausen. In conjunction with the Rheingau we consider the district of Hochheim which has furnished the monosyllabic English term "hock" by which all Rhine wines are confused. Hochheim is situated upon the northern bank of the Main, about 3 m. e. of Mayence. The Riesling is the characteristic and all-pervading wine. The Elbing, Traminer, green Orleans, or Rudesheim Orleans, and the black Burgundy, or the Pineau, are also cultivated to a limited extent. The dominant white-graped vine is

the Kleinerberber, a variety of the Elbing, or Ximenes grape. The best vineyard of Hochheim is the Dechanel or deanery, which is 10 morgen in extent. The Stein is the eastern continuation of the Dechanel, and yields vines which are sometimes said to surpass the best Steinberg and Rudesheim products. The best vineyards of Ellfeld, or Eltville, are the upper and middle Sonnenberg; then follow the Sterzel, and Narrow Way, which are situated lower and more towards the village. The south-western side of the ridge passes into a valley which runs towards Raenthal, and here are the favored positions of Münchnach, and the Gray Stone. The vineyards of Raenthal are situated upon the side of a long hill. The e. of the hill is termed Nonenberg and Rothenberg. The best situations have a southerly and south-westerly exposure, such as Gehren and Kesselring, and the Wissell. The Geierstein is the extreme end of the good positions. The vineyards of Kiedrich are situated about 3 m. from the Rhine. The principal situation is the Graefenberg, and the Mittelberg. The Steinberg is the most famous vineyard of Germany, and is now public property of Prussia. It is a hill about 3 m. distant from the Rhine, and covers a surface of about 80 morgen. There is a farm at the foot of the vineyard, which is kept for the sole object of producing the necessary manure. The Steinberg has various undulations and hollows, by which it is divided into districts yielding a different produce. Of these, three are particularly famous, namely, the Golden Beaker, the Garden of Roses, and the Plänzer. The latter yielded the best piece of cabinet wine in the famous year 1819. There are many villages at the foot of the mountains with good vineyards, such as Halgarten and Vollraths. The celebrated Marobrunner grows close to the Rhine between Erbach and Hattenheim. Stretching for some distance westward of Hattenheim there are some excellent vineyards, and passing Oestreich, Mittelheim and Winkel, the entire country is undulating until it reaches the Johannisberg. This entire flat basin is an enormous vineyard, 6 m. long and 3 m. broad. The Riessling vine predominates, but considerable Elbing is cultivated in the lower parts.

The Johannisberg is a conical hill projected from the Taunus mountain to within about a mile of the river Rhine. The six morgen of vineyards at the foot of the southern declivity, termed the Klausenberg, have only a feeble inclination, and produce the least valuable wine, while the Langeberg and especially the Oberberg produce excellent wine. There are 62 morgen of vineyards, which are manured by the entire produce of a large farm. It is claimed that a bottle of mature Johannisberg Castle is, by the fullness of its taste and the mass of its bouquet, the finest and most powerful drink on earth. From the Johannisberg towards Geisenheim extends a declivity, the best situations of which are termed Morschberg, Lickerstein, and Hoher Rech. Near Geisenheim the Rothe Berg, or red hill, projects, which produces some splendid wine. The vineyards of Rudesheim begin at Eibingen and terminate at the Bingerloch. The vineyards nearest to Eibingen are called the Wüste, Bokhaus, and Tafel, the higher situation towards the forest in the n., the Oberfeld. The vineyards nearest Rudesheim are termed Hinterhaus. The contiguous Rottland is an undulating territory. The greater part of the Rudesheim vineyards is called the Rudesheimer Berg. This has an area of 400 morgen and is the best situation in Rudesheim. The vines cultivated are Riessling, with a sprinkling of Orleans.

The banks of the Rhine from Assmannshausen to Coblenz have many vineyards, but no very good situations. The names of the villages producing wine are Bacharach, Manubach, Caub, Oberwesel, Steeg, Diebach, Weinsberg, Damscheid, Perscheid, Langscheid, and Dellhofen. These cultivate Riessling, often mixed with the small-berried Elbing, and in other parts some Pineau is grown.

The Moselle issues from the western slopes of the Vosges, and unites with the Saar near Trier. It then runs nearly north-ward with many windings, and flows into the Rhine near Coblenz. Its undulating banks in Lorraine, like those of the Saar, are covered with vines, and most frequently with the blue Burgundy grape, but its banks from Trier to Cochem bear white grapes principally. The Elbing occurs along the whole Moselle, and frequently prevails over the Riessling which is everywhere mixed with it. At Piesport, Brauneberg, Oligsburg, Zeltingen, and Trarbach there are vineyards with nothing but Riessling. Much red wine is grown at Piesport, Kersten, Cobern, Cochen, Carden, and a few other places of the lower Moselle. The general character of Moselle wine is that of thin Rhine wine, but owing to the natural want of flavor, the producers of Moselle have devised an artificial flavor from the tincture of the flowers of the elder shrub. The sparkling Moselle has a great reputation. Much of it is made at Coblenz, and large quantities are also manufactured from Rhine wine at Mayence.

The vine is largely cultivated in Austria, and yields annually about 200-300 million gallons. The larger part of its wines, however, is used for home consumption. Of the wines of lower Austria those of Vöslan and Gumpoldskirchen, in the neighborhood of Baden, have, during the last 40 years, obtained some reputation. The red wine produced in them comes from a particular black grape, called the early blue Portugese. That part of the Tyrol which produces wine is situated along the valley of the Adige, beginning near Verona, and running by Botzen up to Meran. The varieties of the grapes cultivated in the Tyrol are, in the Italian part, entirely Italian; in the German part, the Vernatch, a black muscatel, and a variety which the Germans call Geschlafene; also a grape called Tirolinger, or Trollinger, prevail.

The cultivation of the vine in Styria extends from Steinbrück, along the Save, and from Cilli by Hohenegg, Gonolütz, and Windischfeistritz to Marburg, the vineyards in the mountains called Bacher being particularly extensive. Hence, viniculture extends in the direction of Pettau and Fridau, into the most celebrated district, namely, the mountain of Luttenberg. Radkersburg and Windischbühlchen complete the enumeration of the wine-growing districts of Styria. Red wine is produced in only two parts, the Vinarie mountain near Gonovritz, running to Cilli, and in the Sausal mountain. Of the white wines, those of Luttenberg, Kirschbach, and Pickern belong to the better class. Among the vines are to be found Illyrian, Hungarian, a few Italian and French, as well as German vines, but some are quite peculiar to Styria and supposed to be indigenous. The climatic situation of Croatia is particularly favorable to viniculture. A high mountain forms its northern limit, from which many higher or lower ranges of hills run towards the south into the plain, but the mode of cultivation is defective. The prevailing vines are the Grünhainer and Heunisch. Like Croatian wine, the Dalmatian, when mixed with its own bulk of water, gives a fluid which is darker than the darkest Burgundy or Vöslau; they are mostly sold, and transported by ships to Italy. In Istria there is a vinicultural district between Trieste and Pirano, and another near Rovigno and Pola. The island of Vaglia, Cherso and Lussin also produce wine. The varieties of wines cultivated near Trieste are all Italian, among which are the blue Refosco and the white Malvoisie. The fruit of Görtz is excellent, but the wine is very mediocre. An effervescent wine, however, called Ribola, is in some demand, and there are large manufactures of a sweet wine called Picolet, which is sold to Turkey and Russia.

The best wine of Bohemia is that of Melnik, a town situated about 12 m. n. of Prague. It is made from the black Burgundy grape. There are about 3,915 Austrian joch of vineyards in Bohemia, of which each produces about 13 eimer of wine, an eimer being equal to 54 liters.

Hungarian wines.—A great variety as well as a large quantity of wine is produced in Hungary. It yields annually about 400 million gallons. It may conveniently be divided into five wine-growing districts. The northern district, on the left bank of the Danube, and includes the valley of the Waag, in which vines are cultivated from Trentschin to Szered; and also the valley of the Gran. It is mainly characterized by the Hegyalja mountain, containing the celebrated vineyards of Tokay and Erlau, and the less distinguished but fertile vineyards of the Bodrog, which flows from the Carpathian mountains, and the Samos, which issues from Transylvania. The eastern district, between the Theiss on the west and the river Samos and Transylvania on the east, produces the wines of Erdöd, Bakator, and Menes. The central district is between the Danube and the Theiss; its northern limit is at Pesth, and in the south it ends at the Woiwodina. The western district is divided into two parts—one west of the river Raab is represented by the vineyards of Rust; the other east of the Raab is characterized by the wines of Ofen, Somlau, and Weissenburg. The southern district includes the Banat and Woiwodina, the former contains the Werschwitz mountain, and includes the Weisskirchen Banat.

The two dominant vines peculiar to Hungary are the Furmint or Tokay with white grapes, and the Kadarka with black grapes. In the county of Baranya there are some extensive plantations of Burgundy pineau, and around Villary there is much of the Rhenish Riessling, the early Portugese, and the Oporto vine. All varieties of wine called Ausbruch and Maszlacz, including the Tokays, Rust, Menes, and many others, are made by fortifying a quantity of must from plump grapes by means of "dry berries." There are five classes of Tokay. The first is Essence, which is very sweet, with a slight amount of alcohol. When fifty years old it is sold from \$5 to \$15 a bottle; the others are Ausbruch, Maszlacz, Szamorodny, and Ordinari. Karlowitz, in Syrmia, produces the Vermouth liqueur, and the Slibovitz or plum brandy, besides red and white Ausbruch wine. See WINE, *ante*.

GERM THEORY OF DISEASE. A precise definition of the term germ theory of disease is difficult, but in general there are three theories, viz.: the vegetable germ theory, the bioplasmic germ theory, and the physico-chemical theory. The vegetable germ theory, however, is the one usually referred to when no distinction is made. This theory holds that the vegetable organisms of fungoid and algoid forms are the active agents in producing disease by multiplying within the animal organism, and that the vegetable organisms are the descendants of previous organisms; consequently this theory is distinct from that which holds that the organisms are produced by spontaneous generation. This latter theory is, in reality, the physico-chemical theory. The vegetable germ theorists, therefore, believe that all diseases which can be shown to proceed from the introduction of vegetable organisms (and they claim that these are numerous) are epizootic. The bioplasmic theory has its chief advocate in Dr. Lionel S. Beale, who is probably the most accomplished living microscopist. His theory, which has many believers among scientific men, may be briefly stated as follows: Under certain circumstances which may not be perfectly understood, but which nevertheless can be shown to exist, and whose results can be demonstrated, there takes place an abnormal development of bioplasmic particles in the tissues and in the fluids, as from certain injuries, or inflammations resulting from exposure, or pathological states resulting from starva-

tion or other agencies. A degradation of the bioplasmic particles or of the living matter, as bioplasm is called, takes place, and an abnormal organism is formed which has the power of growing and multiplying in suitable pabulum, such as the fluids or tissues of the animal system into which it may be introduced. There are many physicians who do not, however, accept either of these doctrines exclusively, believing that there is evidence that some diseases are produced by vegetable germs, or at least that the principal lesions in some diseases are produced by the multiplication of such germs in quantities which interfere with the circulation, and perhaps thus produce pathological conditions sufficient to account for the other symptoms of the disease. They also believe that the bioplasmic theory accounts for many contagious specific diseases, while in some cases both causes may operate together, or, at least, in the same body, and, moreover, that putrescent fluids containing no discoverable organisms, except perhaps granular bodies, have the power of producing morbid lesions, although perhaps not of so specific a character as that which obtains in some diseases; but this is a matter which is by no means settled. The belief in the power of a septic poison from anything more than a chemical organization, constitutes what may be called the purely chemical theory of disease, and, of course, has no relation to germs whatever.

Extended and laborious investigations have been made for many years, and much valuable knowledge has been acquired; but, as intimated above, much more knowledge, particularly of the natural history of the organisms which are held to be the cause of disease, and of the circumstances attending their development, as well as those by which the diseases are ushered in, is needed; yet, notwithstanding the deficiencies that may exist, it may be assumed as proved that the action of organized particles, or germs, is the cause of a sufficient number of pathological conditions to justify the assertion that the term germ theory of disease is well founded. The various opinions as to the particular manner in which the germs act, or whence they are derived, do not alter the question as to the propriety of the title; and it would be difficult to conduct any lengthened discussion in pathology or medical practice without assuming that living germs are propagators of disease, so widely is the theory accepted. The doctrine may be said to date back at least two centuries, but till recently it was supported by little more than hypotheses, as it was not possible until a considerable degree of perfection had been attained in the construction of the microscope, and until repeated experiments of various kinds had taught great caution as to this explanation, that a sufficient number of scientific facts could be collected to furnish a basis for demonstration of a theory. In 1839, sir Henry Holland advocated an animalcular theory, and in 1847, Dr. J. K. Mitchell of Philadelphia published a volume in which he advocated the doctrine that malarial and epidemic fevers are produced by the introduction into the system of cryptogamic organisms. Before this, Linnaeus, the great Swedish botanist, broached a similar hypothesis. The germ theory of disease, however, as a theory, began to be developed between 1840 and 1850. About the latter date, MM. Rayer and Davaine of France discovered microscopic bodies in the blood of animals affected with anthrax, which they described as being about twice the length of a red blood-globule. Afterwards, in 1857, Brauell found multitudes of rod-like bodies in the blood of men, horses, and sheep dying of anthrax, and he also found them in the blood of diseased animals, from one to ten days before death. But he did not find them in the blood of convalescent animals, which circumstances caused him to regard these organisms as yielding valuable diagnostic and prognostic information; but he also came to the conclusion that they did not themselves constitute the poison of anthrax, and that they were not even the carriers of it, because he infected animals with blood which, as he said, did not contain them. Davaine, in 1863, pronounced the rod-like bodies to be *bacteria*, and afterwards called them *bacteridia*, to distinguish them from the bacteria of putrefaction. He showed that bacteridia were always present in anthrax. According to prof. Otto Bollinger of Munich (*Ziemssen's Cyclopadia of Medicine*), anthrax organisms are found on soils containing much decaying vegetation, as peat moors, dried-up ponds and freshly turned up soils, where intermittent fever prevails; such sections have been termed anthrax districts; but he also says that in many of these there is no intermittent fever, and also that this disease often prevails where there is no anthrax. Bollinger, however, remarks that although the microscope may show that no rod-like bacteria may be present in infectious blood of diseased animals, he has always found the germs present in the form of spherical bacteria.

The germ theory of disease, therefore, may be said to have commenced with the discovery of bacteria in the blood of diseased animals and men. What are these bacteria? They are small microscopic bodies having various forms, sometimes existing in innumerable quantities in putrescent fluids, especially blood and urine, and often found, both before and after death, in vast numbers in the blood of living animals having certain diseases. They are also found in limited numbers in the blood of animals apparently in health. They vary in size as well as in form, some requiring the highest powers of the microscope for their recognition. They have been classified under different names, the classifications of Cohn and Billroth being the best known. The outlines of Cohn's classification are as follows: They belong to the family *phycochromaceæ*, in the natural order *SITZOSPOREÆ*. He divides them into four groups, and also into six genera, whose relations are exhibited in the following table.

Group I. Sphæro-bacteriæ.....	Genus 1. Micrococcus.
Group II. Micro-bacteria.....	Genus 2. Bacterium.
Group III. Desmo-bacteria.....	{ Genus 3. Bacillus.
	{ Genus 4. Vibrio.
Group IV. Spiro-bacteria.....	{ Genus 5. Spirillum.
	{ Genus 6. Spirochæta.

Of these genera the bacterium, vibrio, spirillum, and spirochæta were contained in the vibrona family of Ehrenberg. Cohn regards the ferment of contagion to be due to the presence of a variety of sphæro-bacteria, the micrococci of Hallier. The whole group sphæro-bacteria is divided into three sub-groups, viz.: 1. Chromogen; 2. Zymogen; and 3. Pathogen, which are, respectively, the micrococci of pigmentation, of fermentation, and of contagion. These organisms are too small to be susceptible of measurement. Among the pathogen micrococci are the *M. vaccina*, which have been described by Chauveau and Sanderson as present in vaccine lymph; the *M. diphtheriticus*, and the *M. septicus*, found in the miliary eruption of typhus fever, pyæmia, and other diseases. The true bacteria, as they are sometimes distinguished, or the bacteria of putrefaction, are divided into two species, the *bacterium termo*, and the *bacterium lincola*. The *B. termo* is a small, dumb-bell shaped body, from $\frac{1}{1000}$ to $\frac{1}{1200}$ of an in. in length, having a slow, vacillating motion. The *B. lincola* is larger and more active. It is rod-shaped, and is the ferment found in sour milk. The desmo-bacteria differ from the true bacteria by being occasionally united in chains. The group is divided into *bacillus* and *vibrio*. The bacilli are divided into three species, viz.: 1. *Bacillus subtilis* (the vibrio-subtilis of Ehrenberg), a thread-like form, found in stale milk—length about $\frac{1}{50}$ of an inch. 2. *Bacillus anthracis* (the bacterium carbuncolare of some writers), which is described by Davaine as an immovable, oblong, highly refractive body, found in the blood of animals affected with anthrax, varying from $\frac{1}{1000}$ to $\frac{1}{1000}$ and even $\frac{1}{700}$ of an inch in length, and occasionally found in chains of two or three links. The vibrios are distinguished from all the preceding genera by their rotary motion. (It is convenient to state here that the word bacterium is a slight change of the Greek *βακτηριον*, a small staff, rod, or cane. The Latin word for the same is *bacillus*, whence the use of these words to denote these rod-like organisms.) It is claimed that within the last two years the experiments of Koch, Pasteur and others have demonstrated that various specific diseases are caused by different species of bacteria. The swine-plague is one of these, and the report of Dr. J. H. Detmers, of Chicago, Ill., to the commissioner of agriculture, is an interesting document, presenting many cogent arguments in favor of the vegetable germ theory of disease, but it is probable that the time has not yet arrived to accept, as final, the conclusions to which, with others, he has arrived. The result of some of his experiments showed "that an inoculation with bacilli and bacillus germs cultivated in so innocent a fluid as milk, will produce the disease with just as much certainty as an inoculation with pulmonal exudation from a diseased or dead hog; second, that an animal that has been afflicted with the plague has not lost its susceptibility, but may contract the disease again, though probably in a milder form." It appears, from the experiments of Dr. Detmers, which have been confirmed by Dr. Law, of Cornell university, that the special contagion of swine-plague may be communicated to other animals. Dr. Detmers inoculated two heifers with fluids containing the bacilli of swine-plague, and produced the characteristic symptoms and post-mortem appearances of the disease; and he states that he regards the results of his experiments as sustaining the opinion, "that although cattle are not as susceptible to the plague as swine, it may be transmitted to them in a mild form by inoculation." He remarks that the swine-plague bacteria are not always found in great abundance in the blood, because they lodge in the congested parts, blocking up the capillaries and smaller blood-vessels, producing emboli and ulcerous tumors. In such places the organisms are found in great numbers, and also in the lymphatic glands and kidneys. They are also discharged by the intestines, the lungs, and the skin. He found that the plague was communicated from herd to herd by the contamination afforded by running streamlets in which the bacteria were held in suspension, derived from excrements, or from the carcases of dead animals which had died of the disease. Speaking of measures of prevention Dr. Detmers remarks: "No authenticated case of a spontaneous development of swine-plague has yet come to my knowledge, and the disease, I am more convinced than ever, can be stamped out, but only by adopting the most stringent measures." The experiments of Dr. Law demonstrate the fact that the swine plague may be transferred to sheep and rats, and then transferred back to the hog in an intensified form. Virus was taken from a pig which had been infected from that of a sheep, and a second pig was successfully inoculated, the post-mortem appearances and microscopic examinations furnishing the usual evidence of the presence of the disease. Several successful experiments of the same kind were made. These experiments were followed by inoculations of rats which were infected with all the symptoms of the plague. Virus taken from these rats was employed in successfully infecting pigs in return. Dr. Law is now engaged in a series of experiments to determine whether mild inoculations may not produce a mitigated form which may procure immunity from a second attack. (See SWINE PLAGUE).

The bioplasmic germ theory of disease of Dr. Beale has not received at the hands of

many the favorable attention which it deserves. It will be proper to give some notion of the distinguished author's views, and chiefly in his own words. In his work called *Disease Germs* he says. "Vegetable germs are found in the tissues during life in a state of health—on the mucous membrane of the mouth, they invade the tissues and the intestines, but the living germinal matter of the tissues is probably perfectly free from vegetable germs." "In very many different forms of disease these bacteria germs, and probably of many fungi, are to be discovered in the fluids of the body, but the evidence yet adduced does not establish any connection between the germs and the morbid process." "Germs, apparently of the same nature as those of cholera, are invariably to be found in the old epithelial cells in the mouths of healthy persons, and not rarely in those from many other surfaces. In the intestinal canal, in various slight derangements, they are common enough, so that we cannot but conclude that their presence is due, rather to alterations in the fluids consequent upon morbid changes, than that they are themselves the cause of the disease. They follow the morbid change instead of preceding it;" and it is his opinion that bacteria germs grow and multiply whenever a condition in the animal system favors the production of a pabulum suitable for their development. "From the fact that bacteria grow and multiply, not only in a few special fevers, but in a great variety of different morbid conditions, it is evident that they have nothing to do with any peculiar form of disease." In a chapter discussing "*some difficulties which prevent us from accepting the vegetable germ theory of disease*," Dr. Beale says: "If contagious diseases are due to the entrance into the organism of such minute vegetable germs as those described, is it not wonderful that we escape disease? Minute vegetable germs, resembling those to which contagious diseases have been attributed, are everywhere, though they may easily escape observation. If, however, the pabulum adapted for them be present, and the conditions favorable to their development exist, they soon grow and multiply, and abundant evidence is afforded of their presence." Explaining the nature of disease germs, as he conceives them to be, he says: "I consider it to be almost certain that the material of which these particles are composed has the power of forming matter like itself from pabulum around it, which differs from it in properties and composition. Such living germs may pass from the organism on which they grow to another, and will grow and multiply there if they meet with the proper pabulum." "Upon the whole, then, I venture to conclude that the millions of contagious particles produced in the organism in an eminently contagious disease are all the direct descendants of the very few, or perhaps even, the single particle first introduced; just as the millions of bacteria and fungi developed in certain decomposing organic matters in the course of a few hours may have been produced from one, or at most, a very few particles." It must be admitted that these statements, coming as they do from a microscopist of long experience, and who uses, with consummate skill, lenses having a magnifying power of 5,000 diameters, deserve the most respectful consideration. It appears to be admitted on all hands that some diseases appear to be generated by inoculation with fluids in which the highest powers of the microscope fail to reveal any organisms whatever, and that in other cases all that can be seen is granular matter, so minute in its particles that their form cannot be made out; and yet, in view of the fact that specific diseases, exhibiting well marked pathological characteristics, are produced by such fluids, it must be held that some definite organism is present, and surely such organism must be regarded as a germ. Dr. Beale says that fungoid matter is found within bioplasmic cells. Why, then, may not fungoid cells growing in certain localities contain within themselves certain poison, obtained from the soil in which they grow, capable, when introduced into the animal organism, of producing disease, the vegetable cell acting merely as a carrier? From the investigations of Drs. Klebs of Prague, and Tommasi of Rome, it appears that a certain form of fungus generates fever and ague, and it also appears that another kind of vegetable organism, discovered by Dr. Salisbury of Cleveland, O., has the power of generating the same disease. If these are not identical plants how can their action be explained unless it be supposed that, although the plants differ, they contain the same contagious or disease-producing principles? But Dr. Salisbury has found in the same locality plants of different species which produce, in his opinion, intermittent fever (q.v.). Is it not, therefore, probable, in view of all the facts which have been collected by competent investigators in all parts of the world, that vegetable spores are often the carriers of disease germs? It is well known that vegetables which have been grown with manure, containing quantities of undecomposed feculent matter, are capable, when eaten, of producing disease. Why, then, may not fungi flourishing in localities infected by animals or men, contain within them disease germs which have either been preserved in the soil, or have multiplied from generation to generation? In the fen or morass, disease germs probably remain undecomposed an indefinite period of time if they are far enough beneath the surface, and covered with water. When the shrubbery is cleared away and the surface becomes dry, they spring into activity and generate disease. They may be deeply buried in the earth, and even be hidden in the seams of rocks, and remain harmless until an excavation for a railroad or for building brings them to the surface, where the conditions favorable for their growth exist. The opinion is held by many learned and practical physicians that drinking water obtained from swamps or any localities where the soil contains the poison of malaria, is capable of producing fever

and ague, even when filtered, believing the miasmatic contagium to be soluble. But whether, or not, malarial diseases may be propagated independently of vegetable organisms, as vehicles, they are almost certainly propagated by such means as has been before remarked in this article, and in the article intermittent fever (q.v.). In badly sewered quarters of a city, where typhoid fever and diphtheria prevail, the pabulum for the growth of vegetable organisms is furnished, often abundantly, and bacteria flourish and no doubt spread the poison of these diseases; but that they constitute, in themselves, the poison, is by no means demonstrated. Cryptogams flourish everywhere, but only in certain localities do they produce disease. We are almost forced to the conclusion that the real disease-poison, whether an organism or not, is independent of the other organism, the visible vegetable cell. Adopting this hypothesis, we readily explain the non-appearance of some diseases amongst us. For example, the Russian cattle plague has never visited the United States. If it were produced by cryptogamic organisms, or any other organisms of appreciable dimensions without any contamination of associated virus, it would not be easy to conceive that it should not be generated here. So of the pleuro-pneumonia of cattle; this disease was unknown in this country till 1843, and the history of its importation is known. Is it to be supposed that the vegetable organism which may be found associated with the disease did not exist here previous to the introduction of the disease? But the subject is an exceedingly difficult and complex one, and many circumstances may be used as arguments on either side of the question, which may, after all, require for its solution the application of the reasoning powers as well as the processes of physical science.

The soil where armies had their camping grounds thousands of years ago, or where large cities flourished, may contain germs of disease which have not yet undergone decomposition; for it is known that germs, as in the seeds of plants, may retain their life for thousands of years under favorable circumstances. That human diseases have a human origin, as a rule, or in some instances an animal origin, is not at all improbable. The fact, for instance, that small-pox is produced by the contagion of a previous case of small-pox supports that view. It cannot be shown that small-pox was ever sporadic, and to believe that algoid or fungoid organisms must be present to generate it is inadmissible, for vaccine lymph was so prepared by Chauveau as to be completely free from all organic cells, and still it retained the properties of a virus capable of transmitting the disease. The fluid, however, was granular. Panum, with a view to test the nature of septic poisons, boiled putrid septic fluid, and, as he claims, eliminated all the bacteria by repeated filtration, and yet the clear solution was capable of producing septicæmia. But it is quite possible that vegetable germs are often convenient carriers of disease, and it may be the only way in which some diseases are propagated, as, for instance, anthrax; and, moreover, it is possible that in this disease, and in some others, it is the vegetable germ itself which produces all the pathological conditions. The problem has not been solved. Some medicines, mineral as well as organic, are capable of producing certain specific pathological conditions without the aid of any organisms. Arsenic will produce, when taken internally, peculiar eruptions resembling urticaria, pityriasis or psoriasis. Mercury will produce a peculiar condition called salivation, in which the gums assume a characteristic appearance, accompanied by other well known diseased conditions. It is also capable of producing an eruption on the skin like that of eczema, and sometimes like that of measles. The internal administration of the common nettle is followed by a peculiar vesicular eruption. Is it to be denied, in the light of such facts, that a septic poison, or any species of virus capable of producing specific pathological conditions, may be engendered in the blood without the introduction of organisms? That one disease *may*, with great probability, be generated by vegetable disease germs does not at all warrant the conclusion that other diseases are so produced, especially when it is observed that they are produced by contagion, and never sporadically. As to the probability of those diseases which are peculiarly epidemic being produced by vegetable organisms, unassociated with other disease-producing virus, it is doubtful if a positive opinion can be well founded. Indeed, the very facts which are brought forward to show that vegetable organisms are the generators of specific diseases rather favor the contrary conclusion; as, for instance, the fact, before alluded to, that different species of algoid or fungoid organisms are capable of engendering intermittent fever.

But what are disease germs? It cannot be doubted that the molecules of any compound, even of the most simple, inorganic, are aggregations of atoms—for otherwise we cannot conceive of the nature of a compound—and they must possess dimensions according to the complexity of the molecule. But when we come to consider complex organic molecules, we necessarily have in our minds bodies of much larger dimensions than simple, inorganic molecules, which latter probably contain only a comparatively small number of atoms. Whether it be possible for a microscope of the highest power, to reveal a complex organic molecule like that of a proteid body, is, perhaps, a question difficult to settle. How near we come to the discovery in magnifying 5,000 diameters it is impossible to form an opinion. It is improbable that the powers of the microscope will ever penetrate into the molecular constitution of vital matter to that profound depth, in which the organic molecule is so elementary, as to be incapable of a vitality of its own while surrounded by a proper pabulum: for if the instrument could ever be

given sufficient power, it would probably reveal the fact that the smallest organic molecule, even the ultimate, is a moving, living body, capable of growing and multiplying in its natural pabulum. It is therefore probable, that if such be the relation of vitality to organic molecules, the continued increase of the power of the microscope would only reveal the existence of minuter and, still minuter bioplasmic bodies, previously invisible. If disease germs can proceed from bodies which are invisible with the highest microscopic power, what organism is it which shall receive the designation of original disease germ? It may be that the ultimate molecule of living matter is as independently active as the aggregation of them which we call bioplast, and it may be asked how minute must be the bioplasmic particles, or the germinal particles, and, how simple in constitution, before they lose their power of development and multiplication. Like the starry heavens, which only reveal more worlds with the increase of telescopic power, living, organic fluids seem to contain an almost infinite gradation of minute and more minute bodies. But wherever life begins and life ceases, there are boundaries between living and dead matter which seem impassable unless the particles are carried over by a power which is exclusively* external, and which either confers vitality or destroys it. Is the organism which produces disease as a cell, an organic particle, or a simple poison without any organization consistent with vitality? Whatever it may be, the fact that it is capable of producing a repetition of pathological phenomena of a specific character compels us to regard it as germ-like, and, therefore, as practically a germ.

It can scarcely be doubted that many specific diseases are caused by the introduction into the system of specific germs; but how many diseases are there which come strictly under the denomination of specific? Is diphtheria, for instance, a strictly specific disease, produced by the introduction into the system of specific disease germs, and which produce this disease, and no other? It is doubtful if this question can be confidently answered in the affirmative. Diphtheria is rather a protean disease; assumes various forms, has variable symptoms, runs no specific course, and has no definite, or anything like a definite, period of incubation, although it is attended by the development of fungoid organisms. That it is contagious there is scarcely a doubt, and this may be regarded as strong evidence of the specificity of the contagion. The question is very difficult, and it is probable that the most which can now be said is that diphtheria is the product of a virulent poison, which may be in the form of a gas, or a vapor, sometimes introduced from the sewer, sometimes from the cess pool, sometimes generated by the garbage pile or the compost heap of the farm-yard, sometimes taken from the well, whither, dissolved in water, it has drained through a porous soil from the adjoining privy or cess pool. Whether the organisms that sewer and cess-pool gases and vapors are known to carry are the peculiar disease germs, has not been decided, although it is exceedingly probable that the inflammatory lesions which often take place in this disease, and which contain bacteria, are caused by the plugging up of the capillaries, as in anthrax. It is quite possible that in both these diseases there are two elements, that of the growing organism, mechanically interfering with the circulation, and that of a separate poison, which is the peculiar malignant principle, but which may also be the product of the growth of the organism, or may precede it, and prepare the way for its development. While these questions have not been settled, there are many facts in regard to the propagation of many diseases which are well known, and of the greatest practical value. It is known that the progress of diphtheria may be arrested by the use of a solution of carbolic acid, and that, in general, disinfectant remedies and a blood-enriching and supporting treatment is beneficial. It is also known that negligence, which ought to be regarded as criminal, on the part of public officers, is one of the chief causes of the bad sanitary conditions by which the disease is propagated. When the majority of the community recognize the fact that sewers should be so constructed and so connected with dwellings as not to be the injectors of poisonous vapors and gases, and when they are also fully convinced of the great impropriety of collecting drinking water from pasture fields, swamps, and ditches, which not only contain many animals and receive and transmit to the reservoir much of their excreta, but also receive the drainage of farm-yards and hog pens; and when they are also convinced of the danger of collecting it from streams which receive the sewerage of villages, the remedy for these evils will certainly be forthcoming, especially when neighboring sections of country are of such formation as to afford facilities for the excavation of wells and channels by means of which pure, filtered water from vast gravel beds can be obtained in great quantities.

GERONA, a province in Spain bordering on France and the Mediterranean; 2,279 sq. m.; pop. 325,110. The surface is rough, being intersected with spurs of the Pyrenees, with fertile intervening valleys. Agriculture is the main business of the interior, and ship-building and fishing of the coast population. The Fluvia and the Ter are the only rivers of any importance. The towns of Rosas and Figueras are fortified.

GERRY, ELBRIDGE, 1744-1814; b. Mass.; graduated at Harvard; a member of the colonial legislature, where he became a political leader with Adams, Hancock, and Warren. He was on the committees of safety and supplies which met the day before the battle of Lexington. In 1776, he was a delegate to the continental congress, where he signed the declaration of independence, and served on several of the most important commit-

tees, especially in financial matters, until the organization of the treasury board, of which he was made president. He was again in congress in 1783, and in 1787 became a member of the convention to revise the articles of confederation. He remained in congress four years, and in 1797 accompanied Pinckney and Marshall on a special mission to France. In 1810, he was elected governor of Massachusetts, and was re-chosen the next year. In 1812, he was elected vice-president of the United States, and died suddenly while in office.

GERSON BEN JUDAH, 960-1030; a Jewish rabbi, native of France, author of a commentary on the Talmud, of which only fragments remain. He was celebrated as a reformer among his own people, persuading the Jews to abandon polygamy, and to condemn the repudiation of debts.

GERSONIDES, or BEN GERSON, Levi, a distinguished Jewish philosopher and commentator, b. in Languedoc, towards the close of the 13th century. His family had long been distinguished for piety and exegetical skill, but though he was known in the Jewish community by his commentaries on certain books of the Bible, he never seems to have accepted any Rabbinical post. Possibly the freedom of his opinions, which drew upon him the suspicion of infidelity, may have put obstacles in the way of his preferment. He is known to have been at Avignon and Orange during his life, and is believed to have died at Perpignan in 1370. A portion of his writings consist of commentaries on Aristotle. His most important treatise is entitled *Milhamoth Adonai* (The Wars of God). A portion of it, containing survey of astronomy as known to the Arabs, was translated into Latin in 1342, at the request of Clement VI. The *Milhamoth* is throughout modeled after the plan of the great Jewish philosophy, the *Moré Nebuchim* of Moses Maimonides, and may be regarded as an elaborate criticism from the more philosophical point of view (mainly Averroistic) of orthodoxy as presented in that work.

GERSTER, ETELKA, b. 1856, in Hungary; received her musical education at the conservatory of Vienna. After making her debut as an operatic singer at Venice, she appeared at Berlin, where she was received with great applause. She then sang successively at Florence, St. Petersburg, and London. In 1877, she came to New York as the prima donna of Mapleson's English opera troupe, and sang during the seasons of 1877-78 and 1880-81 in the larger cities of the United States. She owes her success to a voice of much power and expression, and the conscientious dramatic rendering of the operatic characters she assumes.

GERVAISE, or GERVASE, of Canterbury, b. 1150; was one of the monks of the priory of Christ church, Canterbury, and witnessed the burning of the cathedral in 1174. His earliest known effort was a *Tractatus de Combustione et Reparatione Dorobornensis Ecclesie*, being an account of that conflagration and of the subsequent process of rebuilding, written probably about 1184. This was followed about 1194 by *Imaginationes de discordiis inter monachos Cantuarienses et Archiepiscopum Baldricinum*, a detailed relation of clerical disputes which had occurred during the episcopate of Baldwin, from 1165 to 1190. Gervaise's *Chronica de tempore regum Anglie, Stephani, Henrici II., et Ricardi I.*, brings the history down to the death of the last named; but his *Vita Dorobornensis Archiepiscoporum* closes with that of Reginald Fitz-Joceline. These works, which are all of them characterized by laboriousness and trustworthiness, are reprinted in Twysden's *Historiæ Anglicanæ Scriptores*. In the library of Corpus Christi college, Cambridge, there is an unpublished MS., also by Gervaise, containing a work entitled *Mappa Mundi*, and also an English chronicle from the fabulous ages to the death of Richard. The year of the death of Gervaise is not recorded, but the fact that he does not appear to have accomplished any part of his promised chronicle of the reign of John may fairly be taken to imply that he did not live long after 1200.

GESNER, JOHANN MATTHIAS, 1691-1761, a distinguished German classical scholar. He studied at the university of Jena, and in 1714 published a work on the *Philopatris* ascribed to Lucian. In 1715, he became librarian and associate rector at Weimar, in 1729, rector of the gymnashum at Ansbach, and in 1730, rector of Thomas school at Leipzig, where he was associated with Joh. A. Ernesti, and Joh. Sebastian Bach. On the foundation of the university of Göttingen, he became professor of rhetoric and, subsequently, librarian also. His special merit as a classicist is the attention he devoted to the explanation and illustration of the subject matter of the classical authors.

GETTY, GEORGE WASHINGTON, b. Dist. Col., 1819; graduated at West Point; served in various grades in the army, in the "patriot" disturbances on the Canadian frontier, in the war with Mexico, and in Indian wars. In the war of the rebellion he was with the army of the Potomac in several engagements, and was mustered out with the rank of maj.gen. of volunteers. After the war he resumed command of his old regiment, the 3d regular artillery.

GETTYSBURG, the seat of justice of Adams co., Penn., 115 m. w. of Philadelphia, at the terminus of a railroad which connects with the Northern Central at Hanover junction; pop. '70, 3,074. The city is in a fine agricultural region, and is built over several conspicuous hills. There is a Lutheran theological seminary, organized in 1826, which possesses a fine library; also the Pennsylvania (Lutheran) college, organized in

1832. There are many extensive manufacturing establishments, more especially of carriages, eight or ten churches, two banks, and three newspapers. One of the features of the place is the national cemetery for union soldiers. It occupies 17 acres and was dedicated with great ceremony by pres. Lincoln, Nov. 19, 1863. On the brow of the hill stands a monument 60 ft. high, on which is a statue of liberty; at the base, figures representing war, peace, history, and plenty. Nearly 3,600 bodies of soldiers are buried in this cemetery. Another institution is the national homestead for the orphans of union soldiers. The Gettysburg springs have acquired wide fame on account of the medicinal characters of their waters.

GETTYSBURG, BATTLE OF; July 1, 2, and 3, 1863. Early in May the rebel generals had decided upon a concentrated advance upon the northern states. The campaign, inaugurated by the drawn battle of Chancellorsville, had given no decided advantage to either side, and for nearly a month the opposing forces had remained in position on opposite sides of the Rappahanock; when Lee's determination to invade the north was followed by a rapid concentration of all his forces, amounting to 100,000 men. Of these, 15,000 were cavalry, and were under Stuart's command. Slowly and cautiously the vast body of men, severally commanded by Longstreet, Ewell, and A. P. Hill, proceeded by various routes in the direction of the Potomac. At Hagerstown, Md., two columns of the army amalgamated their forces and pushed on to Chambersburg, Pa., where they fell in with a third body under Ewell, who was prepared to advance upon Harrisburg. Meantime, however, the union force under Meade, fully alive to the movements of the enemy, was prepared to intercept Lee's supplies, and harass the rear of his army in every way. It was clear to the confederates, that no successful issue was possible, unless they could rout Meade, and proceed unmolested. Lee, accordingly, ordered a concentration of all his forces near Gettysburg, without any very clear notion as to the exact whereabouts of his enemy. It thus happened that when the advance guard of the confederate army was within 6 m. of Gettysburg, it was ascertained that the town itself was in the possession of the union force. The first encounter took place 2 m. n.w. of Gettysburg, with a decided advantage for the national forces, who took 1000 prisoners, but when, a few hours later, reinforcements under Hill and Ewell arrived from Carlisle, the union force was driven back, with a loss of 5,000 prisoners, beyond the town. Early next morning the struggle recommenced. Both armies had taken up strong positions, the union army having possession of *Cemetery ridge*, 1 m. s. of Gettysburg, while the greater portion of Lee's force was established on the *Seminary ridge*, and supported by a large corps under Ewell, 2 m. distant. The number of men engaged on either side was about equal, and amounted to between 70,000 and 80,000. The fortunes of the day varied several times, and the terrible conflict raged throughout the succeeding day with little intermission; but with the final result that Lee was forced to retreat across the Potomac, with the shattered remains of his army. The losses upon these eventful days were variously estimated, and the rebel loss has never been exactly ascertained, but it is conjectured that his killed, wounded, and prisoners were about 36,000, while on the union side the loss amounted to 23,190, of whom 2,834 were killed, 13,713 wounded, and 6,343 missing.

The battle of Gettysburg is generally regarded as turning the tide of success against the rebellion. The surrender of Vicksburg took place almost exactly at the same time, and these two disasters foreran the steady decline of the confederacy. Congress passed resolutions of thanks for the victory to gen. Meade and gen. Howard, and in a subsequent vote the name of gen. Hancock was included.

GEULINCX, ARNOLD, 1625-1669, a philosopher, b. at Antwerp. He studied at the university of Louvain, obtained there a doctor's degree, and afterwards remained 12 years as a successful lecturer and teacher of the classics and the Cartesian philosophy. For some reason, not certainly known but supposed to have had connection with his religious views, he was compelled to leave Louvain and went to Leyden, where he became a Protestant, and was rescued from starvation by the generosity of a friend, who also obtained for him a lectureship in the university. Entering into this work with great zeal, he continued in it until his death. He was distinguished among the followers of Des-cartes, and his writings contain germs of thought that were afterwards developed by Spinoza and Malebranche. He gave special attention to the doctrine of the relation between the soul and body. Extension and thought, the essences of corporeal and spiritual states, are, he affirmed, distinct, and cannot act upon one another. "I cannot be the author of any state of which I am unconscious, for my very nature is consciousness; but I am not conscious of the mechanism by which bodily motion is produced, hence I am not the author of bodily motion. Body and mind are like two clocks which act together, because at each instant they are adjusted by God. A physical occurrence is but the occasion on which God excites in me a corresponding mental state." He thus originated the theory of occasional causes. But this theory compelled a further advance. "God, who is the cause of the union of body and mind, is the sole cause in the universe. No fact contains in itself the ground of any other. The existence of the facts is due to God, their sequence and co-existence are also due to him. He is the ground of all that is. Apart from God the finite being has no reality." In this he led the way for Spinoza. Geulincx did not handle directly the difficult problem concern-

ing the mode by which extended reality is perceived; yet he shows his opinion that men do not perceive extended reality, but have the idea of it from God. His most important works are on logic, ethics, and metaphysics. They were not published until after his death.

GHIAZNI. See GHIZNI, *ante*.

GIEBERS. See GEUBERS, *ante*.

GHENT, TREATY OF, between the United States and Great Britain, which ended the war between the two countries known as the "war of 1812." The treaty was concluded Dec. 24, 1814, two weeks before the battle of New Orleans. The main provisions were, 1st, Restoration of all territory, places, and possessions taken by either party from the other during the war, except certain islands. Public property remaining in such places at the time of ratifying the treaty was not to be destroyed or carried away, and the same engagement was made as to slaves and other private property. 2d, Article IV. provides the appointment of a commission to decide to which of the two powers certain islands in and near Passamaquoddy bay belong; and if the commission should fail to come to a decision the subject is to be referred to some friendly sovereign or state. 3d, Articles V.-VIII. provide for several commissions to settle the line of boundary as described in the treaty of 1783—one commission to settle the line from the river St. Croix to where the 45th parallel cuts the river St. Lawrence (called the Iroquois or Cataragua in the treaty); another to determine the middle of the water-communications from that point to lake Superior; and a third to adjust the limits from "the water-communication between lakes Huron and Superior to the most north-western point of the lake of the Woods." 4th, Article IX. binds both parties to use their best endeavors to abolish the slave-trade, as being "irreconcilable with the principles of humanity and justice." It is remarkable that the treaty fails to speak of the impressment of American seamen, a main cause of the war, and passes over the claims of the United States to participate in the fisheries, noticed in the treaty of 1783; nor does it conclude the question as to British and American naval forces on the northern lakes.

GHIERIAH, or VIZIADREG, a t. and fortress in British India in the province of Bombay, 170 m. s. of Bombay city. The town has a safe harbor on the Kunvee river. It was once the head-quarters of the most daring piracy infesting all the adjacent seas. After many attempts to break up the corsairs the reduction of the place was effected in 1756, by the English, under admiral Watson and col. Clive. It then passed under the control of the East India company.

GHIRLANDAJO, RIDOLPHO, 1483-1560; son of Domenico, a painter of considerable celebrity. He was certainly one of the earliest students of the famous cartoons of Leonardo da Vinci and Michel Angelo. His works between the dates 1504 and 1508 show a marked influence from Fra Bartolommeo and Raphael, with the latter of whom he was on terms of familiar friendship; hence he progressed in selection of form and modeling his figures in relief. Raphael, upon reaching Rome in 1508, desired Ridolpho to join him; but the Florentine painter was of a particularly home-loving humor and he would not embrace the opportunity. He soon rose to the head of the Florentine oil-painters of his time; and, like his father, accepted all sorts of commissions, of whatever kind. He was prominent in the execution of vast scenic canvases for various public occasions, such as the "Wedding of Giuliano de Medici," and the "Entry of Leo X. into Florence in 1515." In his early manhood he was honest and conscientious as an artist; but from after 1527 he became careless, having already accumulated a handsome property which was more than sufficient to maintain his large family of fifteen children, and his later works show great mannerism and monotonous repetition. His sons traded in France and in Ferrara; he himself took a part in commercial affairs, and at one time paid attention to mosaic work, but after completing one mosaic, the "Annunciation," over the door of the Nunziata, patience failed him for continuing such minute labors.

GIB, ADAM, 1714-88; b. Scotland; the leader of the Antiburgher section of the Scottish secession church; and licensed as a preacher in 1740. In the following year, he was ordained minister of the large secession congregation of Bristol, Edinburgh, being the first in the city inducted into such a charge; and there his powerful intellect and his intensity of character soon secured for him a position of considerable prominence. In 1742, he caused some stir by the publication of an invective entitled *A Warning Against Countenancing the Ministrations of Mr. George Whitefield*; and in 1745, he was almost the only minister of Edinburgh who continued to preach, and to preach against rebellion, while the troops of Charles Edward were in occupation of the town. When in 1747 "the associate synod," by a narrow majority, decided not to give full immediate effect to a judgment which had been passed in the previous year against the lawfulness of the "Burgess oath," Gib led the protesting minority, who forthwith separated from their brethren and formed the Antiburgher synod. It was chiefly under his influence that it was agreed by this ecclesiastical body, at subsequent meetings, to summon to the bar their "Burgher" brethren, and finally to depose and excommunicate them for contumacy. In 1765, he made a vigorous and able reply to the general assembly of the church of Scotland, which had stigmatized the secession as "threatening the peace of the country;" and this apology was further developed in his *Display of the Secession*

Testimony, published in 1774. From 1753 (when after protracted litigation, he was compelled to leave the Bristol church) till within a short period of his death, he preached regularly in Nicolson Street church, which is said to have been filled every Sunday with an audience of 2,000 persons. Besides other publications, he wrote a volume of sacred contemplations (1786), to which was appended an *Essay on Liberty and Necessity*, in reply to lord Kames.

GIBBON, JOHN, b. Penn., 1826; graduated at West Point; served in the Mexican war, on the frontier, and in the war of the rebellion. He was chief of artillery in McDowell's army, and was wounded at Gettysburg. He commanded the 24th army corps, and was actively engaged until Lee's surrender. In 1869 he was placed in command of the 7th infantry.

GIBBONS, ABBY HOPPER, daughter of Isaac Hopper, the prison philanthropist; b. Philadelphia, 1801. She greatly assisted her father in the formation of the woman's prison association and of the "Isaac T. Hopper Home" for discharged prisoners. During the war of the rebellion she rendered valuable service in the union camps and hospitals. Her husband, James G. Gibbons, was a well known abolitionist, and in the riots of July, 1863, their house in New York was one of the first to be sacked. She has been connected officially with many other benevolent works.

GIBBONS, CHARLES, b. Del., 1814; a member of the Philadelphia bar, and for some years in the Pennsylvania state senate, over which he presided. He was an active whig and an abolitionist, and one of the founders of the union league, the constitution of which he originated.

GIBBONS, WILLIAM, b. Philadelphia, 1781. He studied medicine in the university of Pennsylvania, and settled in Wilmington, Del., where he passed the remainder of his life. He devoted much of his time to the study of the natural sciences, and to philological studies, especially of Hebrew, in which he became a proficient. He was a promoter of the Delaware academy of natural science and first president of that institution. He was a member of the society of Friends, and greatly advocated peace and temperance. He is remembered as the author of a tract, *Truth Vindicated*, which he published during the controversy between the Unitarians and Trinitarians, and which is perhaps the best exposition of the tenets of the Friends ever published.

GIBBS, ALFRED, 1824; b. New York; graduated at West Point; and was engaged in the Mexican war. During the war of the rebellion he served in Grant's campaign against Richmond and in other fields. His last active service was on the Indian frontier.

GIBBS, JOSIAH WILLARD, LL.D., 1790-1861; b. Mass.; graduated at Yale, and was a tutor there 1811-15. In 1824, he was professor of sacred literature, an appointment which he held for the remainder of his life. Among his publications are a translation of Storr's *Essay on the Historical Sense of the New Testament*, a translation of Gesenius's *Hebrew Lexicon of the Old Testament*, *Manual Hebrew and English Lexicon*, etc. He was a contributor to Fowler's work on the English language, to Webster's revised dictionary, and to many scientific periodicals.

GIBBS, WOLCOTT, LL.D., b. New York, 1822; graduated at Columbia college. He devoted much attention to the study of chemistry and medicine not only in America, but also in Europe. Upon his return from Europe he was chosen professor of chemistry and physics in the New York Free Academy. In 1863, he became professor at Harvard, and lectured on science as applied to useful arts. During the war of the rebellion he was an active member of the sanitary commission, and in 1873, proceeded, as one of the commissioners, to the Vienna exposition. He is the author of many papers on chemical science in the *American Journal of Science*.

GIBSON, a co. in s.w. Indiana, on the Illinois border, bounded by the White and Wabash rivers, and intersected by the Evansville and Crawfordsville railroad, and Wabash and Erie canal; 460 sq.m. pop. '70, 17,371. The surface is undulating and the soil fertile, producing wheat, corn, tobacco, butter, etc. There are also mines of coal. Co. seat, Princeton.

GIBSON, a co. in w. Tennessee on Ohio and Forked Deer river, traversed by the Mobile and Ohio, the Memphis and Louisville, and the New Orleans, St. Louis and Chicago railroads; 600 sq.m.; pop. '70, 25,666-6,856 colored. The surface is nearly level and largely covered with forests. The chief productions are wheat, corn, cotton, and butter. Co. seat, Trenton.

GIBSON, EDMUND, D.D., 1669-1748, bishop of London. He was in 1686 entered as scholar at Queen's college Oxford, where, at the early age of twenty-two, he distinguished himself by the publication of a valuable edition of the *Saxon Chronicle* with a Latin translation, indices, and notes. This was followed in 1693 by an annotated edition of the *De Institutione Oratoria* of Quintilian, and in 1694 by a translation in two volumes folio, of Camden's *Britannia*, "with additions and improvements," in the preparation of which he had been largely assisted by the volunteered aid of various English antiquaries. Shortly after Tenison's elevation to the see of Canterbury, in 1694, Gibson was appointed chaplain and librarian to the archbishop, and at a somewhat later

period he became rector of Lambeth and arch deacon of Surrey. In the discussions which arose during the reigns of William and Anne relative to the rights and privilege of the Convocation, Gibson took a very active part, and in a series of pamphlets warmly advocated the right of the archbishop to continue or prorogue that assembly. The controversy suggested to him the idea of those researches which resulted in the *Codex Juris Ecclesiastici Anglicani*,—a work which discusses more learnedly and comprehensively than any other the legal rights and duties of the English clergy, and the constitution, canons, and articles of the English church. In 1715, Gibson was presented to the see of Lincoln, whence he was in 1723 translated to that of London, where for twenty-five years he exercised an immense influence, being the authority chiefly consulted by the court on all ecclesiastical affairs. Among the literary efforts of his later years the principal were a series of *Pastoral Letters*, and the *Preservative against Popery*, a compilation of numerous controversial writings of eminent Church of England divines, dating chiefly from the period of James II.

GIBSON, WILLIAM, LL.D., 1784-1838; b. Maryland; educated in medicine in the university of Edinburgh; was a pupil of sir Charles Bell. He accompanied the English troops to Spain and was present at the battle of Corunna, 1809. He received a wound at Waterloo. He was the intimate friend of sir Astley Cooper, and occupied the chair of surgery in Philadelphia for thirty-six years. He was the author of a *System of Surgery* and publisher of several lectures, and a volume of travels.

GIDDINGS, JOSHUA REED, an American statesman, b. at Athens, Pa., Oct. 6, 1795; d. in Montreal, May 27, 1864. While he was yet an infant his parents removed to Canandaigua, N. Y., where they remained until he was 10 years old, when they went to Ashtabula co., Ohio, among the first emigrants to that region. As the age of 17 years he enlisted as a soldier in the war of 1812, joining the expedition sent to the peninsula n. of Sandusky bay, where he took part in several bloody conflicts with the Indians. After the war was over, he taught school for a time, and in 1817 began to fit himself for the bar, to which he was admitted in 1820. He entered upon the practice of his profession at Jefferson, the capitol of Ashtabula co., where he met with great success. In 1826 he represented the county in the state legislature. In 1839 he was elected to congress as the successor of Elisha Whittlesey. The country was then deeply agitated upon the subject of slavery, and Mr. Giddings at once became the advocate of the abolition of the system in the District of Columbia and the territories under the national jurisdiction, admitting at the same time that congress had no power to abolish it in the states. He seized upon every opportunity to agitate the subject and to aid in the formation of a public sentiment hostile to the system and to its further extension. He supported John Quincy Adams, at that time a member of congress, in his efforts to maintain the right of the people to petition that body upon the subject of slavery and to have their petitions respectfully considered. In his course upon questions relating to slavery he exhibited great boldness and a most indomitable spirit of perseverance, keeping congress in a constant state of excitement. Feb. 9, 1841, he delivered a powerful speech upon the Indian war in Florida, insisting that it was waged in the interest of slavery. Not long afterwards the ship *Creole*, while on her way from Norfolk to New Orleans with a cargo of slaves, was seized by them and taken to Nassau, a British port, where their right to liberty was recognized by the authorities. The advocates of slavery held that the slaves were mutineers or pirates, and that it was the duty of the British government to surrender them to the United States. While the excitement caused by the event was at its height, Mr. Giddings introduced in the house of representatives a series of resolutions declaring that the slaves, having simply asserted their indefeasible right to liberty, were guilty of no crime, and that the British authorities at Nassau had done right in permitting them to go free. The domestic traffic in slaves, the resolutions declared, was no less piratical in character than the foreign, and any attempt to re-enslave the men of the *Creole* would be a violation of the constitution and incompatible with the national honor. The resolutions created a tumultuous excitement, and Mr. Giddings was censured by vote of the house for presenting them. He thereupon resigned his seat, but was re-elected by a very large majority. He was kept at his post by successive re-elections until 1859, thus completing a continuous service of 20 years. Until 1848 he was a member of the Whig party, supporting its principal measures, but maintaining his independence in all matters relating to slavery. He did much to develop those views of slavery in its relations to the national government which afterwards became the basis of the republican party. He took a prominent part in the struggle to prevent the extension of slavery to the territory wrested from Mexico by the war of 1846, and in resisting the adoption of the compromises of 1850, especially the fugitive slave law. He was also conspicuous in the debates which preceded the repeal of the Missouri compromise, and in the great struggle by which Kansas was made a free state. His life was often threatened, twice he was assaulted upon the floor of the house by armed men, and on one occasion set upon by a mob in the streets of Washington. On the 8th of May, 1856, while addressing the house, he suddenly fell to the floor in a state of unconsciousness. He soon revived, but his former strength was never fully restored. On Jan. 17, 1858, he fell again in the same way, and for a time was supposed to be dead. He again rallied, however, but was compelled for a time to leave his post. His disease

was an affection of the nervous system, involving the heart. In 1861 he was appointed consul-general for the British North American provinces, with head-quarters in Montreal. He was a man of deep religious convictions, a forcible speaker, and an able writer. In 1843 he wrote a series of political essays signed "Pacificus," which attracted wide attention. A volume of his speeches was published in 1853. He also wrote *The Exiles of Florida*, and *The Rebellion, its Authors and Causes*.

GIFFORD, ROBERT SWAIN, b. Mass., 1840; an American painter almost entirely self-educated. His genius for art was probably inherited from his mother, and as he fortunately met with appreciation early in life, it became developed, and his friends assisted him in every way. He rapidly gained distinction, and became one of the foremost landscape-painters of the United States. His most successful paintings are from studies made in the east in 1870-71. He usually resides in New York city.

GIFFORD, SANFORD ROBINSON, 1823-80; b. New York; educated at Brown university; studied drawing and perspective in New York, and commenced his career as portrait painter. His attention was directed to landscape painting in 1864, when making a pedestrian tour among the Catskill mountains and the Berkshire hills. In 1851, he was elected an associate of the national academy, and in 1854, an academician. He passed two years and a half in Europe in pursuit of his profession. At the breaking out of the civil war Gifford joined the 7th New York regiment, and passed six months in active service. He subsequently visited Colorado and Utah, California, Oregon, British Columbia, and Alaska. His "Mansfield Mountain," "Shrewsbury River," "San Giorgio," "Tivoli," "On the Nile," "Venetian Sails," "Baltimore in 1862," are among the most characteristic of his pieces.

GIFTS, SPIRITUAL, are not the common fruits of faith, but special manifested powers of the Christian life conferred and directed by the Holy Spirit for promoting the welfare of the church. Each gift is the principal spiritual endowment of an individual Christian by which he is to do his part in advancing the general good. While it is supernaturally wrought and graciously bestowed, it is also in accordance with the intellectual and moral qualities of the individual which are themselves also gifts of God. These natural powers it arouses to greater and nobler action. The gifts of grace are manifold, according to the numerous powers of the soul and to the necessities of the church, and by their fullness and variety they display more richly the variegated grace of God, while they all have one origin and are the work of the same spirit. While some one gift was often specially suitable for one man, several were, sometimes, bestowed on the same person, either because his natural endowments were suited to them, or because his special work required them. A combination of them was conferred on the apostles because of their varied official relations to the church. Yet even they were not all equally endowed, or with the same gifts. John, it has been said, was specially gifted with love, spiritual knowledge, and prophetic vision; Peter, with ability to govern the church, to work miracles, and to discern spirits; James, with the power of faithful superintendence of a congregation; Paul, with varied endowments, comprising those of all the rest. Spiritual gifts have been variously arranged by different writers; Dr. Philip Schaff proposes the following classification: 1. "*Gifts of feeling and worship*," including speaking with tongues, interpretation of tongues and prophetic discourse. 2. "*Of knowledge and theology*," including wisdom, knowledge, teaching, and discerning of spirits. 3. "*Of will and church government*," including ministration, government, and miracles. Back of all is faith, as the motive power, taking up the whole man and bringing all his faculties into contact with the divine spirit, and subjecting them to his guidance and control."

GIGNOUX, FRANÇOIS REGIS, b. France, 1816; studied art at Lyons and in the school of free art in Paris, and with Delaroche. In 1840 he came to the United States. His pictures are studies of nature in her more cheerful aspects. Among his productions are "Spring;" "The First Snow;" "The Indian Summer;" "Niagara in Winter;" "The Bernese Alps at Sunrise;" and "Niagara by Moonlight."

GILBERT, Sir HUMPHREY, 1539-83, an English navigator, b. in 1539 in the co. of Devon, second of the three sons of Otho Gilbert, of Greenway. By his mother's side, he was half brother to sir Walter Raleigh, who resembled him in many points of character, and whose early life was largely influenced and guided by his example. Educated first at Eton and then at Oxford, he was destined by his father for the law; but being introduced at court by Raleigh's aunt, Catherine Ashley, he obtained the special favor of the queen, and was thus enabled to follow his natural inclination for active enterprise. Recommended by royal letter to sir Philip Sidney, he received from him an appointment in the army in Ireland; and his services contributed so powerfully to put down the rebellion raging there, that in 1570 he was made a knight and rewarded with the government of Munster. He next served for about five years in the Netherlands, being the first English col. intrusted with command of English forces in that country. Upon his return to his native land, he wrote a remarkable treatise on a subject which, at that time, occupied the minds of men, the possibility of a north-west passage to India; which was published in 1576, without his knowledge, by George Gascoigne as *Discourse of a Discoverie for a New Passage to Cathia*. In June, 1578, Gilbert received letters-patent authorizing himself, his heirs, and assigns, to discover, occupy, and possess

such remote "heathen lands, not actually possessed of any Christian prince or people as should seem good to him or them." Disposing not only of his patrimony, but also of the estates in Kent, which he owned through his wife, he at once prepared to put the permission to use, and was joined in the enterprise by his brother Raleigh. By the end of the summer of 1578, a fleet of 11 sail, with 400 mariners and men-at-arms, was collected off the coast of Devon; but the gallant projectors were singularly unfortunate in the character of some of their associates. Dissensions broke out among the captains, and disorder among the crews. Knollys, for example, boasted that, as a kinsman to royalty, he was of more value than 20 knights, and insolently rejected Gilbert's invitation to dinner; while his men, encouraged by their captain's conduct, filled the town of Plymouth with uproar and riot, which finally culminated in murder. It was not until Nov. 19 that Gilbert set sail, with his forces reduced to seven ships and 150 men. The history of the voyage is involved in obscurity; but about the beginning of the summer, or a little earlier, in 1579, the fleet returned to England, with little, it would appear, to report, except that it had lost one of its chief ships and one of its bravest captains, Miles Morgan, in an encounter with the Spaniards. Gilbert lent his three ships to the government for service against the Spaniards on the Irish coast; but in July 11, 1582, we still find him complaining to Walsingham that he had not received the moneys that were due him, and that thus he was prevented from doing more for his queen and country. He was already planning a new expedition; and at length, in 1583, his fleet was ready. The queen, though she had at first dissuaded Gilbert from his purpose, and would not permit Raleigh to accompany him, wrote to him by his brother's hand, that she wished him "as great good hap and safety to his ship as if she herself were there in person," and sent him as a token a golden figure of an anchor guarded by a lady. On June 11, he departed from Plymouth with five sail; but on the 13th, the *Ark Raleigh*, which had been built and manned at his brother's expense, "ran from him in fair and clear weather, having a large wind." This desertion was the cause of no small displeasure to the admiral, and he wrote to sir George Peckham to solicit his brother to make the crew an example to all knaves; but it appears not improbable (according to Hayes in Hakluyt's collection) that the reason of their conduct was the breaking out of a contagious sickness in the ship. On Aug. 5, Gilbert landed in Newfoundland, and took formal possession of it in the queen's name; but proceeding southwards with three vessels, he lost the largest near cape Breton, and was at last constrained to return homewards with the *Golden Hind* and the *Squirrel* as the only remnant of his fleet. "On Monday, Sept. 9," reports Hayes, the captain of the *Hind*, "the frigate was near cast away, yet at that time recovered; and giving forth signs of joy, the gen., sitting abaft with a book in his hand, cried out unto us in the *Hind*: 'We are as near to heaven by sea as by land.' The same Monday night the frigate's lights were suddenly out, and it was devoured and swallowed up by the sea." So perished sir Humphrey Gilbert.

GILBERT, Sir JOHN, b. 1817, exhibited his first picture in 1836, which was a water-color drawing of "The Arrest of Lord Hastings by the Protector Richard, Duke of Gloucester." In 1839, he first exhibited at the British institution, and since that date has sent many pictures there and to the royal academy. His best known oil pictures are: "Don Quixote giving Advice to Sancho Panza," followed by many other subjects from Cervantes; "The Education of Gil Blas;" a scene from "Tristram Shandy;" "Othello before the Senate;" "The Murder of Thomas Becket;" "The Plays of Shakespeare," a tableau in which the principal characters in each play are introduced; "Charge of Cavaliers at Naseby;" "A Drawing-room at St. James's;" "A Regiment of Royalist Cavalry;" "Rubens and Teniers;" "The Studio of Rembrandt;" "Wolsey and Buckingham;" "A Convocation of Clergy;" and "The Entry of Joan of Arc into Orleans." More recently he has exhibited at the royal academy "The Field of the Cloth of Gold;" "Tewkesbury Abbey;" "Mrs. Gilbert and Don Quixote and Sancho at the Castle of the Duke and Duchess;" "Crusaders and Richard II. Resigning the Crown to Bolingbroke;" "Cardinal Wolsey at Leicester Abbey;" and "Doge and Senators of Venice;" "Ready;" and "May-dew." He is familiarly known to the public as an illustrator of books, pictorial newspapers, and several weekly publications. He was for many years an artist contributor to the *Illustrated London News*. Most of the best editions of the British classics have been illustrated by him, and he spent many years in the illustrations of a rare edition of Shakespeare. In 1852, he was elected an associate, in 1853 a member, and in 1871 president of the society of painters in water-colors, in whose gallery he has been a constant exhibitor. He has been knighted.

GILBERT DE LA PORRÉE, (1070-1154), a scholastic philosopher, born at Poitiers. He studied philosophy under Bernard of Chartres, and theology under Anselm and Radulfus of Laon. He lectured first at Chartres, as church teacher, and afterwards at Paris, and in both places acquired great distinction. His reputation led to his being recalled to his native city, of which, in 1141, he was made bishop, but continued none the less a metaphysician, mingling his favorite science with theology, and resorting for proof and illustration, oftener to Aristotle than to the Scriptures or the fathers. His philosophy was realistic and his style obscure. At the council of Rheims, in 1148, he was accused of holding erroneous views concerning the nature of God. These views

proceeded from the metaphysical notion that pure or abstract being is prior in nature to that which exists or is manifested. This pure being is God, in distinction from the triune God, as existing and known to men. The pure form of being, that by which God is God, must be distinguished from the three persons who are God by participation *in this form*. The form or essence is one, the persons or substances are three. It was this drawing of a distinction between divinitas and Deus that led to his arraignment and condemnation by the council. He submitted to their judgment, assented to the propositions drawn up as an expression of the true doctrine, and continued afterwards in his diocese, until his death, unmolested and on friendly terms with his former opponents. He wrote many books, some of which have been printed, and others are extant in manuscript. His chief logical work, *De sex Principiis*, was regarded in its day with reverence approaching that which Aristotle inspired. It furnished work for numerous commentators, among whom even Albertus Magnus did not disdain to appear.

GIL BLAS, the hero of Le Sage's famous novel, represented as timid, yet audacious, well disposed, yet easily led astray, shrewd, yet easily gulled, good natured, but of loose principles. The novel is said to have been founded on a Spanish romance, the *Life of Guzman de Alfarache*.

GILES, a co. in s.e. Tennessee, on the Alabama border, watered by Elk river and intersected by the Louisville and Great Southern railroad; 600 sq. mi.; pop. '70, 32,413—12,738 colored. The surface is uneven and the soil fertile, producing wheat, corn, cotton, butter, etc. Co. seat, Pulaski.

GILES, a co. in s.w. Virginia, on the Kanawha river; 300 sq. m.; pop. '70, 5,875—598 colored. The surface is high and rugged, with many mountain peaks. Chief productions, wheat, corn and hay. Co. seat, Pearisburg.

GILES, HENRY, b. Ireland, 1809; educated in the Roman Catholic church, but changed his religious opinions several times, and finally became a Unitarian pastor at Greenock, and afterwards at Liverpool. In 1840, he came to the United States, where he was soon recognized as an able lecturer. He has published *Lectures and Essays, Christian Thoughts on Life, and Illustrations of Genius in some of its Applications to Society and Culture*. He has also written largely for periodicals and newspapers. One of the most successful subjects chosen by him was the *Genius and Writing of Shakespeare*.

GILES, SAINT (Ægidius, Egidio, Gil, or Gilles), according to the *Breviarium Romanum*, was an Athenian of royal descent, and from his earliest years distinguished for piety and charity. On the death of his parents he, while still young, distributed among the poor his entire patrimony, including his very tunic, which garment effected a miraculous cure upon the poor sick man to whom it had been given. Shrinking from the publicity of this and many other (apparently) involuntary miracles, he betook himself to Provence, where, after a residence of two years with St. Caesarius at Arles, he withdrew into the solitude of the neighboring desert, living upon herbs and the milk of a hind which came to his cell at stated hours. Here he was discovered by the king of France, who, on a hunting expedition had tracked the hind to the hermit's cave. With the reluctant consent of Ægidius, a monastery was now built on the spot, he being appointed its first abbot. The functions of this office he discharged with prudence and piety until his death, which occurred some years later.

GILES, WILLIAM BRANCH, 1762-1830; b. Va.; studied at Princeton college, but did not graduate; was admitted to the bar, and in 1790, elected to congress, and afterwards several times re-chosen. He was United States senator for 12 years, and governor of Virginia from 1827 to 1830. He was at first a federalist, but finally joined the Jeffersonian democrats. His fame was in a measure owing to the able reply he made to an absurd attack upon Alexander Hamilton, the secretary of the treasury. Giles published *Political Letters to the People of Virginia*.

GILGAL. Three towns of this name are mentioned in the Bible. The first and most important was situated "in the e. border of Jericho," on the border between Judah and Benjamin. Josephus places it 50 stadia from Jordan and 10 from Jericho, but these measurements do not agree with the position of Jericho with respect to Jordan. Jerome places Gilgal 2 Roman m. from Jericho, and speaks of it as a deserted place held in wonderful veneration by the natives. This site, which in the Middle Ages appears to have been lost—Gilgal being shown further n.—has lately been recovered by a German traveler (Schokke), and fixed by the English survey party. It is about 2 m. e. of the site of the Byzantine Jericho, and 1. m. from the modern Erilha. A fine tamarisk, traces of a church (which is mentioned in the 8th c.), and a large reservoir, now filled up with mud, remain. The place is called Jiljâlîch, and its position north of the valley of Achor (Wâdy Kelt) and e. of Jericho, agrees well with the biblical indications above mentioned. A tradition connected with the fall of Jericho is attached to the site.

The second Gilgal, mentioned in Joshua in connection with Dor, appears to have been situated in the maritime plain. Jerome speaks of a town of the name 6 Roman m. n. of Antipatris (Râsel 'Ain). This is apparently the modern Kalkilia (vulgarly Gal-gilia), but about 3 m. n. of Antipatris is a large village called Jiljâlîch, which is more probably the biblical town.

The third Gilgal was in the mountains near Bethel. Jerome mentions this place also. It appears to be the present village of Jiljilia, about 7 English m. n. of Beitia (Bethel).

GILGIT, a term applied to a secluded valley-state on a tributary of the upper Indus in India, and also to the river and its basin. The village is 4,800 ft. above the sea, and is built on a bed of river alluvium, which forms a terrace 30 or 40 ft. above the water. The place has suffered so much in recent wars that it will take long to recover its former prosperity.

GILL, THEODORE NICHOLAS, PH.D., b. New York, 1837; a naturalist residing in Washington, and a member of the national academy of science. He has published a great number of papers on fishes, mammals, and in other departments of natural history. Among the collected papers published by the Smithsonian institution are *Arrangement of the Families of Mollusks*; *Arrangement of the Families of Mammals*, and *Arrangement of the Families of Fishes*.

GILLEM, ALVAN G., 1830-75; b. Tenn.; graduated at West Point. He served on the Union side in the war of the rebellion, and was present in a number of engagements, and was promoted to brevet maj.gen. He took a prominent part in the re-organization of the state government of Tennessee.

GILLESPIE, a co. in s.w. Texas, watered by tributaries of the Colorado; 900 sq.m.; pop. '80, 5,228—132 colored. The surface is rough, but good for pasturage. The chief productions are wheat, corn, and hay. Co. seat, Fredericksburg.

GILLESPIE, GEORGE, 1613-48; b. Scotland; a prominent member of the Presbyterian party in the Westminster assembly, entered the university of St. Andrews as a "presbytery bursar" in 1629. On the completion of a brilliant student career, he became domestic chaplain to Lord Kennure, and afterwards to the earl of Cassilis, his conscience not permitting him to accept the episcopal ordination which was at that time in Scotland an indispensable condition of induction to a parish. While with the earl of Cassilis he wrote his first work, *A Dispute Against the English Popish Ceremonies Obtruded upon the Church of Scotland*, which, opportunely published (but without the author's name) in the summer of 1637, attracted considerable attention, and within a few months was found by the privy council to be so damaging that, by their orders, all available copies were called in and burnt. In April, 1638, soon after the authority of the bishops had been set aside by the nation, Gillespie was ordained minister of Wemyss (Fife) by the presbytery of Kirkcaldy, and in the same year became a member of the famous Glasgow assembly, before which he preached a sermon which pronounced so decidedly against royal interference in matters ecclesiastical as to call for some remonstrance on the part of Argyll, then lord high commissioner. In 1642, Gillespie was translated to Edinburgh; but the brief remainder of his life was chiefly spent in the conduct of public business in London. Already, in 1640, he had accompanied the commissioners of the peace to England as one of their chaplains; and in 1643 he was appointed to the Westminster assembly. Here he took a prominent part in almost all the protracted discussions on church government, discipline and worship, supporting presbyterianism by numerous controversial writings, as well as by an unusual fluency and readiness in debate. Shortly after his return to Scotland, Gillespie was elected moderator of the assembly; but the laborious duties of that office (the court continued to sit from July 12 to Aug. 12) told fatally on a constitution which, at no time very vigorous, had of late years been much overtaxed; and, after many weeks of great weakness, he died at Kirkcaldy. In acknowledgment of his great public services, a sum of £1000 Scots was voted, though destined never to be paid, to his widow and children by the committee of estates. A simple tombstone, which had been erected to his memory in Kirkcaldy parish church, was in 1661 publicly broken at the cross by the hand of the common hangman, but was restored in 1746. Among the other of Gillespie's works may be mentioned the *Treatise of Miscellany Questions, wherein many useful questions and cases of Conscience are discussed and resolved*, published posthumously (1649); and *The Ark of the Testament opened*, being a treatise on the covenant of grace, also posthumous.

GILLESPIE, WILLIAM MITCHELL, 1816-68; b. New York; graduated at Columbia college. In 1845 he was appointed professor of civil engineering in Union college and held the chair till his death. Among his works are *Rome as Seen by a New Yorker*; *Roads and Railroads, a Manual of Road Making*; *Philosophy of Mathematics*; *The Principles and Practice of Land Surveying*; etc.

GILLISS, JAMES MELVIN, 1810-65; b. Dist. Col.; capt. in the navy. In 1838 he organized one of the first astronomical observatories in the United States, and, in 1845, he finished the construction of a naval observatory. In 1861 he assumed the charge of the national observatory. He published *The United States Astronomical Expedition to the Southern Hemisphere in 1849-52*.

GILLMORE, QUINCY ADAMS, b. Ohio, 1825; a graduate of West Point where he was assistant instructor. He became distinguished in the war of the rebellion at Hittern Head, in the capture of fort Pulaski, and in the reduction of forts Sumter and Wagner. He was made maj.gen. of volunteers, but preferred to retain his real rank of maj. of engineers. He published an account of the reduction of fort Pulaski, *Practical Treatise*

on Limes, Hydraulic Cements, and Mortars; and Engineer and Artillery Operations against the Defenses of Charleston Harbor in 1863.

GILLOTT, JOSEPH, 1800-72; an English manufacturer known the world over for his steel pens. His first effort in this direction was in a garret, and the result, sold to small shop-keepers in Birmingham. They were stiff and awkward "barrel pens." From time to time he made important improvements, until his pens almost entirely superseded the goose-quill. Of late years the work of his own manufactory has reached the enormous number of 150,000,000 per annum. He accumulated vast wealth, and left at his country seat a remarkably valuable gallery of paintings and other works of art.

GILMAN, ARTHUR, b. Ill., 1837; educated in New York. He removed to western Massachusetts and gave his attention chiefly to education and religious instruction, and afterwards became editor of the publications of the American Tract society. He has published a *Manual of English Literature* and an edition of Chaucer.

GILMAN, CAROLINE, b. Mass., 1794; daughter of Samuel Howard, of Boston, wife of rev. Samuel Gilman of Boston. She has written poems and other works, among which are *Jephthah's Rush Vow* (written at the age of 16), *Jairus's Daughter*; *Recollections of a New England House-keeper*; *Recollections of a Southern Matron*; *Ruth Raymond, or Love's Progress*; *Poetry of Traveling in the United States*; *Verses of a Lifetime*; *Mrs. Gilman's Gift Book*; *Oracles from the Poets*; and *Stories and Poems by a Mother and Daughter*.

GILMAN, CHANDLER ROBBINS, 1802-65; b. Ohio; educated in the university of Pennsylvania and began the practice of medicine in New York. In 1840, he was professor of obstetrics and diseases of women and children in the college of physicians and surgeons, and subsequently of medical jurisprudence. His literary work consisted of translating Bischoff's *On the Periodical Discharges of the Uterus*; in which he was assisted by Dr. Theodore Tolkampf, and compiling a work *On the Relations of the Medical to the Legal Profession*; and an edition of *Beck's Medical Jurisprudence*.

GILMAN, DANIEL COIT, LL.D., b. Conn., 1831; graduated at Yale, and was superintendent of schools in New Haven. In 1856-72 he was professor of physical geography at Yale, and college librarian. In 1863 he was state superintendent of schools, and from 1872 to 1875 was president of the university of California. In 1875 he was chosen president of Johns Hopkins university, Baltimore. He has published many reports and addresses on scientific, educational, and historical subjects.

GILMAN, JOHN TAYLOR, 1753-1828; b. N. H. On the morning after the battle of Lexington he marched with 100 volunteers to Cambridge, Mass., and took service in the provincial army. He became assistant treasurer of New Hampshire, and afterwards treasurer; and in 1780 was a delegate to the Hartford convention to devise measures for defense. He was a member of the continental congress, and one of the commission to settle the war accounts of the states. In 1797 he was chosen governor of New Hampshire, and was re-elected thirteen times.

GILMAN, SAMUEL, D.D., 1791-1858; b. Mass.; graduated at Harvard in 1811. After filling the position of tutor in mathematics at Cambridge for two years (1817-19) he became, in the latter year, pastor of the Unitarian church in Charleston, S. C., filling the pulpit until his death. In 1856 he published *Contributions to Literature, Descriptive, Critical, Humorous, Biographical, and Poetical*; He also published *Memoirs of a New England Village Choir*; *Pleasures and Pains of a Student's Life*; and translated Boileau's *Satires*.

GILMER, a co. in n. Georgia drained by the Coosawattee; 500 sq.m.; pop. '80, 8,386-128 colored. It is traversed by spurs of the Blue Ridge, and offers delightful scenery. Among its minerals are gold, iron, and marble. Corn, wheat, and butter are the chief productions. Co. seat, Ellijay.

GILMER, a co. in central West Virginia watered by the Little Kanawha; 512 sq.m.; pop. '70, 4,338-27 colored. The surface is rough and thickly wooded; the soil fertile and especially adapted to pasturage. There are deposits of salt and iron. The chief products are corn, oats, and butter. Co. seat, Glenville.

GILMORE, JOHN R., b. Mass., 1823; one of the founders of the *Continental Monthly*, a short-lived literary periodical. He has written a number of sketchy volumes over the signature of "Edmund Kirke." Some of his works are, *Among the Pines*, *My Southern Friends*, *Down in Tennessee*, *On the Border*, *Among the Guerrillas*, and a campaign life of James A. Garfield (1880).

GILPIN, a co. in n. central Colorado among the Rocky mountains, connected with Denver by the Colorado Central railroad; 150 sq.m.; pop. '70, 5,490. The whole district is from 9,000 to 10,000 ft. above the sea level. It is one of the richest gold mining regions in the country. Silver and copper are also found. The agricultural productions are not large. Co. seat, Central City.

GILPIN, BERNARD, 1517-83, an English clergyman of remarkable scholarship, diligence, liberality, and usefulness, b. at Kentmere, Westmoreland. He studied at Queen's college, Oxford, stimulated by the example and writings of Erasmus and giving great attention to the Scriptures in the original languages. Soon after graduation, he

was chosen fellow of his college and took orders. On the opening of the new foundation of Christ church Wolsey made him one of the head masters. At that time the university was divided on the subject of the reformation. Gilpin at first took ground against it; but, in preparing himself with an honest mind to oppose it, he became convinced that it was in accordance with Scripture and the fathers, and embraced it. In 1552, he became vicar of Norton and was licensed by Edward VI. as a "general preacher." On queen Mary's accession, he resigned his living and went to Louvain, where he resisted all the efforts of the priests to win him back to the Roman church. Returning to England during the queen's life, he found the persecution of the Protestants still in progress. His uncle, bishop Tunstall, gave him the living of Easingdon and the rectory of Houghton-le-spring, protecting him also, notwithstanding his open avowal of Protestant opinions. Afterward, however, he was summoned to trial before bishop Bonner, but having broken his leg on the journey, before he was able to travel again the queen died. He then devoted himself again to the diligent prosecution of his parish work and to itinerant labors through the country. Queen Elizabeth offered him the bishopric of Carlisle, which he declined. He continued until his death rector of Houghton, residing constantly in his parish except when he visited the ruder parts of the county of Northumberland, into which he introduced more regular habits of life and more of Christian influences than had resulted from any previous labors. The parts of Redesdale and Tynedale are particularly named as the scenes of his labors. The people there, living on the borders of the two counties, had long led a lawless life, subsisting mostly on plunder. Gilpin went fearlessly among them, holding forth the commands and sanctions of Christianity, and did much to change the character of the country. Hence he was commonly called the "*northern apostle*," and for generations his name was repeated with reverence. His chief labors, however, were in his own parish of Houghton, which included 14 villages. It yielded him an ample income, being then, as now, one of the richest benefices in the north. He was a bachelor, and in hospitality resembled the character ascribed to the primitive bishops. Every fortnight 40 bushels of corn, 20 bushels of malt, and a whole ox were consumed in his house, beside ample supplies of many other kinds. Having a large and wide parish and a great multitude of people, he kept a table for them every Sunday from Michaelmas to Easter. The rectory house was also open to all travelers, and so great was the reverence which surrounded him that his liberality was rarely abused; even the most wicked were awed by it. His skill in settling differences was as celebrated as his hospitality and his preaching; his benevolence was wisely exerted in providing instruction for the young, including homely learning for poor children generally, and preparation for the universities for a select number of promising youths. Of these last, he kept 24 in his own house, the greater part of them being poor men's sons, on whom he bestowed meat, drink, clothing, and instruction. From them, and from the grammar school which he founded, he supplied the church of England with a great store of learned men. Of his scholars, he always maintained at least six at the universities at his own expense, and, after their graduation, charged himself with the care of their settlement. Bishop Carleton, who wrote his life, was one of these scholars. Gilpin was also assiduous in his attentions to the sick, and by his systematic beneficence won his second title of "*father to the poor*."

GINLI, in Norse mythology, a great hall at the world's southern end, brighter than the sun. It will stand when heaven and earth have passed away, and good and upright men will inhabit the place to all eternity.

GINCKELL, GODART VAN, 1640-1703; first earl of Athlone. He was the head of an ancient and noble family, and bore the title of Baron van Reede. In his youth, he entered the Dutch army, and in 1688 he followed William, prince of Orange, in his expeditions to England. In the following year he distinguished himself by a memorable exploit—the pursuit, defeat, and capture of the Scottish regiment which had mutinied at Ipswich, and was marching across the fens to their native land. It was the alarm excited by this mutiny that facilitated the passing of the first mutiny act. In 1690, Ginckell accompanied William III. to Ireland, and commanded a body of Dutch cavalry at the battle of the Boyne. On the king's return to England, gen. Ginckell was entrusted with the conduct of the war. Among those who held command under him was the marquis of Ruvigny, the recognized chief of the Huguenot refugees. Early in June, Ginckell took the fortress of Ballymore, capturing the whole garrison of 1000 men. The English lost only 8 men. After reconstructing the fortifications of Ballymore, the army marched to Athlone, then one of the most important of the fortified towns of Ireland. The Irish defenders of the place were commanded by a distinguished French gen., Saint-Ruth. The firing began on June 19th, and on the 30th the town was stormed, the Irish army retreating towards Galway, and taking up their position at Aghrim. Having strengthened the fortifications of Athlone and left a garrison there, Ginckell led the English, on July 12th, to Aghrim. An immediate attack was resolved on, and after a severe and at one time doubtful contest, the crisis was precipitated by the fall of Saint-Ruth, and the disorganized Irish were defeated and fled. A horrible slaughter of the Irish followed the struggle, and 4,000 corpses were left unburied on the field, besides a multitude of others, that lay along the line of the retreat. Galway next

capitulated, its garrison being allowed to retire to Limerick. There the viceroy, Tyrconnel, was in command of a large force, but his sudden death in Aug. left the command in the hands of gen. Sarsfield and the Frenchman D'Usson. The English army came in sight of the town on the day of Tyrconnel's death, and the bombardment was immediately begun. Ginckell, by a bold device, crossed the Shannon and captured the camp of the Irish cavalry. A few days later he stormed the fort on Thomond bridge, and after difficult negotiations a capitulation was signed, the terms of which were divided into a civil and military treaty. Thus was completed the conquest or pacification of Ireland, and the services of the Dutch general were amply recognized and rewarded. He received the formal thanks of the house of commons, and was created by the king, first earl of Athlone and baron of Aghrim. The immense forfeited estates of the earl of Limerick were given to him, but the grant was a few years later revoked by the English parliament. The earl continued to serve in the English army, and accompanied the king to the continent in 1693. He fought at Landen, and assisted in destroying the French magazine at Givet. In 1702, he took command of the Dutch, serving under the duke of Marlborough. He died at Utrecht, Feb. 10, 1703. On the death of the ninth earl without issue, in 1844, the title became extinct. [*Encyc. Brit.* 9th ed.]

GINGRAS, a co. in n.e. Dakota not included in the census of 1870. Its area is about 1500 sq.m. The Dakota river has its rise here, a branch of the Cheyenne flows through the county.

GINGUENÉ, PIERRE LOUIS, 1748-1815; b. at Rennes, in Brittany. He was a voluminous writer and controversialist. As director-general of the commission of public instruction, he aided greatly in the reorganization of popular education. He was a member of the institute, and in 1798 was appointed by the directory minister plenipotentiary to the king of Sardinia. He contributed to the literary history of France (Benedictines), and wrote the *Histoire Littéraire d'Italie*, upon which his reputation chiefly rests. This work was surprisingly successful, numerous editions being published, besides three translations into Italian.

GINNUNGA GAP. See BURE.

GIOBERTI, VINCENZO (*ante*). 1801-52, an Italian statesman and philosopher, the great object of whose life was the deliverance of his country. This, in his conception of it, included emancipation not only from foreign armed force, but also from foreign modes of thought, which were contrary to its genius and destructive to its authority in European affairs. That authority he regarded as connected with the supremacy of the papacy—its intellectual and moral supremacy, rather than its political domination. This distinction must be kept in mind by all who would understand either the writings of Gioberti or his life. In order to commend the priests to popular regard, he advised them to put themselves at the head of the social movement, introduce needed reforms and diffuse instruction. He also called on the educated men of Italy to regain their former ascendancy by uniting faith with knowledge. With this object in view he wrote his remarkable work on the civil and moral supremacy of Italy, in which he considers civilization as vitally connected with religion. The substance of the book is: "Italy has been twice at the head of European civilization; once in ancient times, and again in the middle ages. In the latter period it owed its position to the popes, who were then the natural arbiters of princes and the spiritual sovereigns of the nations. The downfall of Italy is due to the downfall of the papacy. The problem now is to restore the papal power, as a *moral dominion* based on religion and public opinion." In his most important work, *The introduction to philosophy*, Gioberti teaches "that the source of all human knowledge is in God, that it is one whole and, in a manner, identical with God himself." The name which he gives it is, 'The Idea or Thought.' "This is communicated to man in proportion as he is capable of receiving it, and is 'the light which enlighteneth every man that cometh into the world.' Man receives it by his reason, which is capable of directly beholding it, and this intuition of the idea is the origin and first cause of all the knowledge of natural things which the mind of man possesses. It rises to the mind at the same moment as the thought which apprehends it; yet it does not rise *within* the mind, but enters it from without. It is the principle of knowledge to the human mind, from the very first exercise of its powers as a thinking being. Yet this direct intuition of the divine thought by the reason, although the origin of all thoughts in the soul, is by itself imperfect. In order to render it available it must be reflected on; and in order to reflection language is necessary. For this purpose language was given, by means of which God originally reveals to man that which he had caused him to behold by direct intuition, and by means of which also this same revelation is repeated and carried on from generation to generation. Yet language is not the cause of human knowledge; nor is it, in the case of ordinary knowledge, the medium of the exhibition of the divine thought to the mind (for that shines immediately on the mind) but it is the occasion of its being completely revealed. For the purposes of ordinary and natural knowledge the combination of intuition with language is the method ordained; but *supernatural knowledge* can be conveyed only by means of language, and divine truths are not seen by intuition but are *believed*. Yet all knowledge, of every kind, has its source in the divine thought, and consists of such views of it as the individual

is capable of. Besides reason, which is capable of beholding the divine thought, man has internal and spiritual feelings that are modifications of the mind and are preserved by feeling, and material and external feelings, that have reference to the properties of bodies and are perceived by sensation and the outward senses. The ordinary range of modern metaphysics is confined to these internal and external feelings; and it is a common error to substitute the internal feeling as a first principle instead of that which is apprehended by the reason through direct intuition and revealed to the soul by language and reflection. It is an equally common error to substitute reflection on the internal and external feelings for reason as the initiatory instrument of that knowledge which is the basis of philosophy. But it is by the intuition of the divine thought that meaning is imparted to these various feelings, external and internal, and to the various sensible objects by which they are surrounded. The basis of all knowledge is the knowledge of *being*, yet not of its abstract idea but of the personal Being, God himself acting as a cause and producing *existences*. He is in fact the only being, because he alone has being in himself. The knowledge of this Being is gained by revelation through the written word, wherein he declares himself, "*I am that I am*;" and the mind beholds him and has him made known to it internally through the reason, independently of all external sensations. God being the only Being, all other things are only existences; and man learns from the revealed word that the One being creates existences; not that he extends himself into these various manifestations, as Hegel says, not that he causes them to emanate from himself, as other pantheists say, but that he *creates* them. Man thus learns that they are individual, real things, having a kind of personality; that the act of creation gives them this reality and individuality; and that nothing but the act of creation could assure to him the reality of external things. All knowledge of philosophy must begin with a knowledge of beings and existences and of their relation to each other; and that, not of abstract being and existences, but of one concrete Being and of many concrete individual existences. And a knowledge of these latter the divine thought gives to man by a direct view of them which imparts life and meaning to all his sensations and feelings in connection with them. The principles of knowledge are objective, eternal and absolute; not the creation of the mind, nor sought out by it, but presenting themselves to it, unsought, as first truths—the foundation of other truths. The permanent possession by man of the divine thought depends, in a measure, on himself; he may consent to it and obey it and thus secure it; or may rebel against it and thus lose it. It is by participation of it that individuals possess a moral personality; it is the vital principle, the entire withdrawal of which would result in annihilation. As it creates and governs the universe, it is the soul of the world; as it dwells in the human mind, it is knowledge; as it actuates, produces, determines, and classifies the powers of nature, it is the generic and specific essence of things; and the basis of generality is the divine Being himself, having in himself the ideas of all possible things and the power of giving effect to those ideas."

GIOBERTINE TINCTURE, a preparation for restoring writings or paintings which have from age become illegible. In some cases the process has recovered documents which have been partially expunged, and the parchment written over. (See *PALIMPSEST*, *ante*). The inventor was Giovanni Antonio Gioberti; 1761–1824; a native of Piedmont; secretary of the society of agriculture at Turin, and professor in the university in that city.

GIOCONDO, or **JOCUNDUS**, **FRA GIOVANNI**, 1450–1530; a native of Verona. He was a Dominican friar, studied archaeology in Rome, and made a remarkable collection of ancient inscriptions which he presented to Lorenzo di Medici. He was the designer of the fortifications of Treviso, and of works which saved Venice from inundation. He was architect to the emperor Maximilian, and was employed by Louis XII. in building the bridges of Notre Dame and the Hotel Dieu. In Venice, he built a great warehouse which was decorated by Titian and Giorgione. The pope appointed him to succeed Bramante as the architect of St. Peter's, and he was there a co-laborer with Raphael. He was proficient in philosophy, theology, and classical literature, and wrote notes on Cæsar's *Commentaries*.

GIOTTINO, **TOMMASO DI STEFANO**, 1324–57; a Florentine painter to whom are attributed the frescos in the chapel of the Florentine church of Santa Croce representing the miracles of pope St. Sylvester as narrated in the *Golden Legend*. A large number of works have been attributed to the same hand. He has been particularly praised for well-blended chiaroscuro.

GIOVIO, **PAOLO**, 1483–1552; b. Italy; educated at Pavia. He began the study of medicine, but soon left it for that of history. Under papal and royal protection he was granted many honors, chiefly for the work of a free-lance, fighting without principle or conscience for the best paying employers. When the constable of Bourbon plundered Rome he was stripped of his property, but he was immediately consoled with the bishopric of Nocera. *The History of His Own Time*, is his most important work, but it is untrustworthy.

GIRARD, **PHILIPPE HENRI DE**, 1775–1845; a French mechanician. In his early life he manifested a strong aptitude for mechanical invention, and he also at that time

devoted his attention to botany, painting, and literature. When at the Revolution his family took refuge in Italy he supported himself there for some time by painting, but afterwards, at the age of 18, he established a soap manufactory at Leghorn. Returning to France after the fall of Robespierre, he began to conduct a chemical work at Marseilles, but soon afterwards judged it prudent to go to Nice, where he obtained the professorship of chemistry and of natural history. About 1800, he went to Paris, where, in company with his brother Frederick, he established a soap manufactory. In 1804, he and his brother took out a patent for what is known as the fountain lamp; and at the "exposition" of 1806 he was awarded a gold medal for his one-cylinder direct-acting steam-engine. Napoleon having in 1810 decreed a reward of one million francs to whoever should invent a machine for the spinning of flax equally successful with those in use for the spinning of hemp, Girard, after a course of experiments, invented and patented a flax-spinning machine. In 1813, he established a flax mill at Paris and another at Charonne, in both of which he made use of his machine; but although he was declared to have earned the reward offered for the invention, the fall of Napoleon in 1815 left the decree unfulfilled. Girard, who expected that the expenses connected with his experiments would be met by the promised premium, now got into serious money difficulties, and had to leave France for Austria, where, besides establishing a flax mill at Hirtenberg, he built the first line of steamships on the Danube. In 1825, at the invitation of the emperor Alexander I. of Russia, he went to Poland, where he erected a flax manufactory, round which grew up a village which received the name of Girardow. He was also appointed chief engineer of the mines of Poland. In 1844, he returned to Paris, and exhibited at the "exposition" a large number of inventions, including a machine for combing flax, a machine for making gunlocks, several new improvements in guns, a piano of double octaves, and a new instrument called the tremolophone. For his inventions connected with the manufacture of flax, a gold medal was decreed to him by the jury; and in 1845, the society of inventions awarded him a sum which raised the pension he received from the Russian government to 6,000 francs. Besides the inventions already mentioned, Girard was the author of a large number of others, many of them of considerable importance in connection with various departments of industrial machinery. A pension of 6,000 francs was bestowed in 1857 on his only surviving brother, and another on his niece. [*Encyc. Brit.*, 9th ed.]

GIRARD, STEPHEN, 1750-1821; was b. at Bordeaux, France. At the age of 13 he commenced life as a sailor, and followed his avocation with such assiduity that he was enabled, before the French requisitions of age and service allowed, to become master and capt. in Oct., 1773. His first mercantile venture was to San Domingo in 1774, whence he proceeded in July to the then colony of New York. After trading for three years between New York, New Orleans, and Port au Prince, he went to Philadelphia in May, 1777, and gave up the sea for a mercantile career. While he was engaged most successfully in the prosecution of an extensive trade, the yellow fever in its most malignant type broke out in Philadelphia, sweeping away one-sixth of its population. When, during its height, a hospital was established, for which it seemed almost impossible to secure competent management, Girard devoted himself personally, fearless of all risks, to the care of the sick and the burial of the dead, not only in the hospital, of which he became manager, but throughout the city, supplying the poorer sufferers with money and provisions. Two hundred children made orphans by the ravages of the fever, were in a great measure thrown on his care. From this period his success commercially and financially was unexampled. He gave a portion of his time to the management of municipal affairs for several years, and rendered efficient service as warden of the port and as director of many public institutions. On the dissolution of the bank of the United States he instituted what is known as the Girard bank. During the war of 1812, "he rendered valuable services to the government by placing at its disposal the resources of his bank, at a time of difficulty and embarrassment subscribing to a large loan which the government had vainly sought to obtain." Girard added to his other avocations that of a practical agriculturist. He is chiefly remembered for his magnificent bequest, the foundation of Girard college (q. v.).

GIRARD COLLEGE, an institution in Philadelphia founded by Stephen Girard for the support and education of poor white male children without fathers. The endowment included 45 acres of land and \$2,000,000. Boys are admitted between the ages of 6 and 10, and are to be apprenticed to some industrial occupation when between 14 and 18. According to the will no minister or ecclesiastic of any sect or church was allowed to visit the premises on any pretext, or to have any connection with the institution, and this rule is strictly enforced. The construction of the buildings was commenced in 1833, and finished in 1848. It accommodates 500 boys, who are supported and educated by the institution, there being 20 teachers. The Girard college buildings are 2 m. from Independence hall, Philadelphia (by Ridge ave. cars), and occupy 42 acres of land inclosed by massive stone walls. The main building is considered to be the finest existing specimen of Corinthian architecture. It is built of white marble, 218 by 160 ft. and 97 ft. high, being planned as nearly as possible in accordance with the minute directions left by Girard.

GIRARDIN, JEAN PIERRE LOUIS, b. Paris, 1803; a chemist, professor at Rouen and Clermont. He has paid special attention to the application of chemistry to art, industry, and agriculture, and has published several works on such subjects.

GIRARDON, FRANÇOIS, 1628-1715; a sculptor whose works are typically characteristic of the epoch of Louis XIV. As a boy, he had for master a joiner and wood-carver of his native town, Baudesson by name, under whom he is said to have worked at the chateau of Liébault, where he attracted the notice of the chancellor Séguier. By the chancellor's influence, Girardon was first removed to Paris and placed in the studio of François Anguier, and afterwards sent to Rome. In 1650, he returned to France, and seems at once to have addressed himself with something like ignoble subserviency to the task of conciliating Le Brun, who owed his start in life to the same patron. Girardon is reported to have declared himself incapable of composing a group, whether with truth or from motives of policy it is impossible to say. This much is certain, that a very large proportion of his work was carried out from designs by Le Brun, and shows the merits and defects of Le Brun's manner—a great command of ceremonial pomp in presenting his subject, coupled with a large treatment of forms which, if it were more expressive, might be imposing. An immense quantity of work at Versailles was intrusted to him, and, in recognition of the successful execution of four figures for the Bains d'Apollon, Le Brun induced the king to present his protégé personally with a purse of 300 louis, as a distinguishing mark of royal favor. In 1650, Girardon was made member of the academy; in 1659, professor; and in 1695, chancellor. Five years before, on the death of Le Brun, he had also been appointed inspector-general of sculpture—a place of power and profit. In 1699, he completed the bronze equestrian statue of Louis XIV., erected by the town of Paris on the Place Louis le Grand. This statue was melted down during the revolution, and is known to us only by a small bronze medal finished by Girardon himself. His "Tomb of Richelieu" (church of the Sorbonne) was saved from destruction by M. Alexandre Lenoir, who received a bayonet-thrust in protecting the head of the cardinal from mutilation. It is a capital example of Girardon's work; but amongst other important specimens yet remaining may also be cited the "Tomb of Louvois" (St. Enstache), that of Bignon (St. Nicholas du Chardonneret), and decorative sculptures in the Galerie d'Apollon and Chambre du Roi, in the Louvre. Although chiefly occupied at Paris, Girardon never forgot his native Troyes. In the Hotel de Ville is still shown a medallion of Louis XIV., and in the church of St. Remy a bronze crucifix of some importance—both works by his hand. In 1850, M. Corrad de Breban, who has given much time to researches concerning artists native to the town of Troyes, published a *Notice sur la vie et les œuvres de Girardon*. [Encey. Brit., 9th ed.]

GIRDLE, a band of leather or other material worn round the waist, either to confine the loose and flowing outer robes so as to allow freedom of movement, or to fasten and support the garments of the wearer. In southern Europe and in all eastern countries the girdle was and still is an important article of dress. Among the Romans it was used to confine the tunica; and so general was the custom that the want of a girdle was regarded as strongly presumptive of idle and dissolute propensities. It also formed a part of the dress of the Greek and Roman soldier; the phrase *cingulum deponere*, to lay aside the girdle, was as equivalent to quitting the service. It was used as now in the east to carry money in; hence *zonam perdere*, to lose one's purse. Girdles and girdle-buckles are not found in early Celtic interments, nor are they frequent in Gallo-Roman graves. But in Frankish and Burgundian graves they are almost constantly present, often ornamented with plaques of bronze or silver, and the clasps and mountings chased or inlaid with various ornamental designs, occasionally including figures of the cross, and rude representations of Scripture subjects. In later times girdles are frequently represented on brasses and monumental effigies from the 12th to the 16th century. They were either of leather or of woven materials, often of silk and adorned with gold and gems. The mode in which they were worn is shown on the effigies; usually fastened by a buckle in front, the long free end of the girdle was passed up underneath and then down over the cincture, and through the loop thus formed, the ornamented end hung down in front. Among the sumptuary regulations of Edward III., there were prohibitions against wearing girdles of gold and silver unless the wearer were of knightly rank or worth £200 a year. Similar regulations against extravagance in girdles are occasionally found to the 16th century. The brasses of the 15th c. present many beautiful examples of ladies' girdles, which were often worn like that of the knight with the ornamental end hanging down in front, sometimes with both ends depending from a large clasp or ornamental fastening in the center. Allusions to the girdle are common in the poetry of the 16th and 17th centuries. The purse, the dagger, the rosary, the pen and inkhorn and the bunch of keys, were carried suspended from it, and hence it was an ancient custom for bankrupts or insolvent persons to put off or surrender their girdles in open court. It is recorded that the widow of Philip I., duke of Burgundy, renounced her right of succession by putting off her girdle upon the duke's tomb. The girdle, which was a very important element in the dress of the Levitical priesthood, does not appear as an ecclesiastical vestment in the Christian church until the 8th century. Germanus, who died in 740, mentions the gir-

de worn by deacons; and Hierabanus Maurus in the succeeding century speaks of the girdle as one of the regular vestments, and refers to its symbolism. Some centuries later the church had to discountenance the extravagance in this article of attire, and splendor in the decoration of girdles was denounced as secular and unbefitting the ecclesiastical character.

GIRODET DE ROUSSY, ANNE LOUIS, 1767-1834; better known as Girodet-Trioson. He lost his parents in early youth, and the care of his fortune and education fell to the lot of his guardian, M. Trioson, by whom he was in later life adopted. After some preliminary studies under a painter named Luquin, Girodet entered the school of David, and at the age of twenty-two he successfully competed for the Prix de Rome. At Rome he executed his "Hippocrate refusant les présents d'Artaxerxes," and "Endymion dormant," a work which was hailed with acclamation at the salon of 1792. The peculiarities which mark Girodet's position as the herald of the romantic movement are already evident in his "Endymion." The firm-set forms, the gray, cold color, the hardness of the execution are proper to one trained in the school of David, but these characteristics harmonize ill with the literary, sentimental, and picturesque suggestions which the painter has sought to render. The same incongruity marks Girodet's "Danae," and his "Quatre Saisons," executed for the king of Spain, and shows itself to a ludicrous extent in his "Pingal," executed for Napoleon I. in 1802. This work unites the defects of the classic and romantic schools, for Girodet's imagination ardently and exclusively pursued the ideas excited by varied reading both of classic and modern literature, and the impressions which he received from the external world afforded him little stimulus or check; he consequently retained the mannerisms of his master's practice, whilst rejecting all restraint on choice of subject. The credit lost by "Pingal" Girodet regained in 1806, when he exhibited "Scène de Déluge," to which (in competition with the Sabines of David) was awarded the decennial prize. This success was followed up in 1808 by the production of the "Reddition de Vienne," and "Atala au Tombeau"—a work which went far to deserve its immense popularity, by a happy choice of subject, and remarkable freedom from the theatricality of Girodet's usual manner, which, however, soon came to the front again in his "Révolte de Caïre" (1810). His powers now began to fail, and his habit of working at night and other excesses told upon his constitution; in the salon of 1812, he exhibited only a "Tête de Vierge;" in 1819, "Pygmalion et Galatée" showed a still further decline of strength; and in 1824—the year in which he produced his portraits of Cathelineau and Bonchamps—Girodet died.

GIUDICI, PAOLO EMILIANI, b. 1812; an Italian author, professor in the Pisa university, and in the royal academy of fine arts in Florence. In 1867, he was a member from Sicily in the Italian parliament. He has published *Storia dei Comuni*; *Storia del teatro Italiano*, and a translation of Macaulay's *History of England*.

GIUNTA PISANO, the earliest Italian painter whose name is found inscribed on an extant work, exercised his art from 1202 to 1236; he may perhaps have been born towards 1180, in Pisa, and died in, or soon after, 1236. There is some ground for thinking that this family name was Capitenò. In recent times some efforts have been made to uphold his deservings as an artist, thereby detracting so far from the credit due to the initiative of Cimabue; but it cannot be said that these efforts rest on a very solid basis. To most eyes the performances of Giunta merely represent a continuous stage of the long period of pictorial inaptitude. The inscribed work above referred to, one of his earliest, is a crucifix, now or lately in the kitchen of the convent of St. Anne, in Pisa. Other Pisan works of like date are very barbarous, and some of them may also be from the hand of Giunta. It is said that he painted in the upper church of Assisi,—in especial, a crucifixion dated 1236, with a figure of father Elias, the general of the Franciscans, embracing the foot of the cross. In the sacristy is a portrait of St. Francis, also ascribed to Giunta; but it more probably belongs to the close of the 13th century. This artist was in the practice of painting on cloth stretched on wood, and prepared with plaster.

GIZZARD, a strong and muscular portion of the alimentary canal, in birds especially, for grinding the coarse food upon which they subsist. Some of the Bryozoa have such a gizzard between the oesophagus and true stomach. Many gasteropods have gizzards armed with teeth or calcareous plates, and some cephalopods have both powerful jaws and strong gizzards between the crop and the first stomach. Many insects and crustaceans have gizzards, in some cases armed with strong teeth. Most birds have a true gizzard, excepting only those whose food is soft and succulent. The food is acted upon by gastric juice before it is ground up in the gizzard. This organ is the homologue of the pyloric portion of the stomach of most of the vertebrates. It is lined by a horny epithelium, the "gizzard skin," and most birds swallow pieces of gravel to assist the gizzard in grinding the food.

GLADDEN, WASHINGTON, b. Penn., 1836; graduated at Williams college in 1859. He has been pastor of Congregational churches in Brooklyn and Morrisania, N. Y., and North Adams, Mass.; and was an editor of the *Independent*, in New York, and the *Sunday Afternoon*, afterwards named *Good Company*, in Springfield, Mass. He is now pastor of the North Congregational church in Springfield. He has been also a popular

and successful lecturer, and a frequent contributor to periodicals. He has published *From the Hub to the Hudson*, *Plain Talks on the Art of Living*, and *Workingmen and their Employers*.

GLADHEIM, in Norse mythology, the dwelling-place of Odin, the largest and noblest of edifices. In this home is Valhalla (the hall of heroes), radiant with gold, to which are conducted all who fall in battle. The ceiling is formed of spears; the roof of shields, and the benches are strewn with coats of mail. It has 540 gates, through each of which 800 men can go abreast.

GLADSTONE, WILLIAM EWART, (*ante*), after his retirement in 1875 from the leadership of the liberal party, still showed himself, both in and out of parliament, alive to the questions, moral and political, which occupied the attention of his countrymen. Especially did he protest against the course pursued by the Beaconsfield ministry in regard to the war between Russia and Turkey, and also in relation to the affairs of India. It was largely through his influence that a public sentiment was at length formed against Beaconsfield's policy, which led to the dissolution of parliament, and a new election in the spring of 1880, in which the liberals triumphed by a large majority. Mr. Gladstone was thereupon placed once more at the head of the government, where he still remains. In 1879, he published *Gleanings of Past Years*.

GLADWIN, a co. in n. central Michigan, reached by the Jackson, Lansing, and Saginaw railroad; 570 sq.m.; pop. 74, 265. Its surface is uneven, and thus far but little cultivated. Co. seat, Gladwin.

GLAISHER, JAMES, b. England, 1800; a meteorologist and aeronaut; the man who has gone furthest from the surface of the earth. His remarkable ascent to 37,000 ft. (very near 7 m.), is recorded as the greatest effort of balloon ascension. He is a fellow of the royal society, and succeeded admiral Fitzroy as president of the meteorological department of the board of trade. His principal work is *Travels in the Air, a Popular Account of Balloon Voyages and Ventures, with Recent Attempts to Accomplish the Navigation of the Air*.

GLANVILL or GLANVIL, JOSEPH, 1636-80; was educated at Oxford university, where he graduated in 1658. In 1666 he obtained the cure of Abbey church at Bath; in 1678 he became prebendary of the church of Worcester, and acted as chaplain-in-ordinary to Charles II. He wrote *The Vanity of Dogmatizing, or Confidence in Opinions, manifested in a Discourse of the shortness and uncertainty of our Knowledge, and its Causes, with Reflections on Peripateticism, and an Apology for Philosophy* (1661); *Philosophical Considerations concerning the existence of Sorcerers and Sorcery; Lux Orientalis* (1662); and *Sadduceismus Triumphatus*.

GLAS, JOHN. See GLASSITES, *ante*.

GLASCOCK, a co. in e. Georgia, on the Ogeechee river; 235 sq.m.; pop. '80, 3,577—1,071 colored. The surface is generally level; productions, wheat, corn, and cotton. Co. seat, Gibson.

GLASS (*ante*), in some of its coarser forms, was manufactured in this country in the colonial period. John Smith's *History of Virginia* alludes to the subject, and expresses the opinion that in this as in other things the "labor of the colony," as early as 1615, "had been misdirected." Seven years later, a building begun in Jamestown, Va., for this manufacture, was abandoned on account of troubles from the Indians. Somewhere about 1754, a Dutchman named Bumper established a glass factory in Brooklyn, N. Y., and the first bottle he made is preserved among the curiosities of the Long Island historical society. Another factory of the same kind was established in Temple, N. H., in 1779 or 1780, but was shortly burned down and never rebuilt. Another was established by a company of which Albert Gallatin was one, on the Monongahela river, above Pittsburgh in 1789, and tradition asserts that there was one also in New Haven, Conn., in 1789, or before. The first glass factory in Pittsburgh, was built in 1795, and in it the production of window-glass was first begun in this country. Other factories were soon afterwards built in the same place, also in Rensselaer and King counties, N. Y., and in New Jersey and Massachusetts. From this time onward, the manufacture kept pace with the growth of the country, until, in 1830, the number of furnaces for the manufacture of crown-glass was 21, of flint-glass 23. The value of the flint-glass annually produced was estimated at \$1,250,000. In 1840, the number of establishments had increased to 81, giving employment to more than 3,000 people, and a capital of more than \$2,000,000. The increase in the next 20 years was very considerable, the number of glass works in 1860 being 112, employing over 9,000 men and more than \$6,000,000 of capital. In 1870 the number of glass factories of every kind was 201—the number of people employed 15,822 (11,505 men, 715 women, and 3,602 children) capital invested, \$14,111,642; wages paid \$7,846,425; raw material used, \$6,133,168, annual product, \$19,235,862. Of the whole number of factories 35 were devoted to the production of window-glass, 11 of them in New Jersey, 10 in Pennsylvania, 7 in New York, and the others in Massachusetts, Maryland, and Illinois. The establishments devoted to the manufacture of glass-ware of all kinds was 114, producing goods valued at \$14,300,949. Forty-two of these factories were in Pennsylvania, 32 in New York, 11 in Massachusetts, 8 in New Jersey, 6 in Ohio, and the others in Connecticut, Indiana,

Kentucky, Missouri, New Hampshire, and West Virginia. Eighteen establishments were producing stained glass to the value of \$297,480; 29 were employed in the production of cut-glass, the goods annually being valued at \$470,875. Five plate-glass establishments reported an annual product of \$355,250. The census of 1870, however, is believed to be deficient in its statistics of glass production, falling far below the actual truth. Since that time the business has developed rapidly. The value of the glass produced in this country in 1880 can hardly be less than \$30,000,000, and may be much more. We are exporting glass hollow-ware largely. American table glass is not inferior to that of England and France. American window-glass (not plate) finds a ready market abroad as well as at home. American plate-glass is inferior to that of Europe, but is not likely to remain so long. The importations hitherto of foreign glass are rapidly diminishing. The total importation in 1872-73 was \$7,420,044; in 1873-74, \$6,257,978—a reduction of more than \$1,000,000 in a single year.

GLASS, SOLUBLE. See *Water Glass, ante*.

GLASS SPONGE, or GLASS ROPE, the name of various siliceous sponges which have the sponge spicules prolonged into a flexible loosely twisted cable of glassy threads. Their nature is not well understood.

GLAUCONITE, a mineral found in secondary and tertiary green sands and chloritic marls, the composition of which is about: Silica, 46 to 56 per ct.; ferruginous oxide, 20 to 25 per ct.; potash, 5 to 13 per ct.; water nothing to 10 per ct.

GLAUCUS, an artist of Chios, said to have invented the art of soldering metals. His most famous work was the iron base on which was placed a silver vase dedicated by Alyattes II., king of Lydia, to the god at Delphi, spoken of with admiration by Herodotus.

GLAUCUS, son of Hippolochus, and grandson of Bellerophon, mythical progenitor of the kings of Ionia, was a Lycian prince, who, along with his brother Sarpedon, assisted Priam in the Trojan war. The incident between Glaucus and Diomedes, as related in the *Iliad*, is well known. He was afterwards slain by Ajax; but his body was carried back to Lycia, as that of his brother had been. It seems probable that these two sons of the Lycian land—the land of light—who leave it in youth, but are carried thither again (by Hypnos and Thanatos) when their course is done, originally were here meant to represent respectively the creeping light of the early dawn (Sarpedon) and the brightness of the open day (Glaucos).

GLAUCUS, son of Minos by Pasiphaë, when a child, playing at ball or pursuing a mouse, fell into a honey pot and was smothered. His father, after a vain search for him, consulted the oracle, and was referred for an answer to the person who could suggest the aptest comparison for one of the cows of Minos which had the power of assuming three colors. Polydus of Argos, who had likened it to a mulberry (or bramble), which changes from white to red, and then to black, soon afterwards discovered the child. Minos then desired him to restore young Glaucus to life; and on his failure to do this, he was sentenced to be entombed alive along with the corpse. Having in the sepulcher killed a serpent by which he had been attacked, he saw its companion revivify it by laying upon it a few leaves of a certain herb. The same herb he applied successfully to Glaucus. This curious myth is now very generally admitted to be of a solar character; but interpreters are far from unanimous as to the significance of the various details.

GLAUCUS, surnamed **PONTIUS,** a fisherman changed to a god and endowed with the gift of unerring prophecy. A principal seat of his cultus was at Arthedon, where the inhabitants claimed to be descended from him; but he was also worshipped extensively, not only on the coasts of Greece, but also on those of Sicily and Spain, it being customary for fishermen and sailors at certain seasons to watch during the night for the moment when he should come on his periodical rounds accompanied by his train, in order that they might consult him as an oracle. He is generally represented as endowed with most of the attributes of Nereus, but occasionally he is identified with Melicertes. He is sometimes said to have instructed Apollo in prophecy. In art he is depicted as a vigorous old man with long hair and beard, his body terminating in a scaly tail.

GLAUCUS, surnamed **POTNIEUS,** a deity worshiped chiefly in Corinth, is to be distinguished from Glaucus Pontius. He was the son of Sisyphus by Merope, and the father of Bellerophon. According to the legend, he was destroyed by his own mares, the most common form of the story being that he was torn to pieces by them. Accounts differ as to the place of his violent death, and also as to the immediate occasion of it. Sometimes it is represented as having happened at Ioleus, at the funeral games of Pelias, but usually the scene is laid at Potniæ. He is most frequently represented as having offended Aphrodite by having kept his mares from breeding; but other versions of the myth are that he had fed them on human flesh to make them more spirited, or that they had been suffered to drink at a sacred well at Boeotia, or that they had eaten the herb hippomanes. He was the subject of a lost tragedy of Æschylus. His affinities with Poseidon Hippius are obvious; and it may be taken for granted that the frantic horses of Glaucus Potnieus represent the stormy wave of the sea, just as Glaucus Pontius is himself a personification of the ocean in its friendlier and calmer moods.

GLEDE, a name in the common English versions of the Bible which probably means culture.

GLEIG, GEORGE, 1753-1839; bishop of Brechin, Scotland, was the son of a farmer, and was born in Kincardineshire. He received his early education at the school of Arbutnott, and at the age of thirteen, entered King's college, Aberdeen, where he especially distinguished himself in mathematics and the moral sciences. In his 21st year he took orders in the Scottish Episcopal church, and was ordained to the pastoral charge of a congregation at Pittenween, Fife, whence he removed in 1790 to Stirling. His pastoral duties allowing him considerable leisure for literary pursuits, he became a frequent contributor to the *Monthly Review*, the *Gentleman's Magazine*, the *Anti-Jacobin Review*, and the *British Critic*. He also wrote several articles for the third edition of the *Encyclopædia Britannica*, and on the death of the editor, Cohn Macfarquhar, in 1793, was engaged to edit the remaining volumes. One of his principal contributions to this work was the article "Metaphysics." He was twice chosen bishop of Dunkeld, but the opposition of the primus rendered the election on both occasions ineffectual. In 1808 he was consecrated assistant and successor to the bishop of Brechin, in 1810 was preferred to the sole charge, and in 1816 was elected primus of the Episcopal church of Scotland, in which capacity he greatly aided in the introduction of many useful reforms, in fostering a more catholic and tolerant spirit, and in cementing a firm alliance with the sister church of England.

GLENGARRY, a co. in n.e. Ontario, on the St. Lawrence and the Quebec boundary, 462 sq.m.; pop. '71, 20,524. The Grand Trunk, and Montreal and Ottawa railroads intersect. The chief town is Alexandria.

GLEN'S FALLS, a village in Warren co., N. Y., on the upper branch of the Hudson river, and on the Rensselaer and Saratoga railroad, 18 m. n.e. of Saratoga springs. It is noted for its cave, water-power, mills, lime, block marble, canal, water-works, beautiful fountain, and handsome soldiers' monument. It has a large iron foundry, machine-shop, gas works, paper-mill, grist-mills, stone sawing-mill, large saw-mills, run by water-power with a total of 42 gates, 6 lath-mills, steam-saw and planing-mills, plaster-mills, lime-kilns, carriage manufactories, a sewing-machine factory, 2 gun-shops, banks, weekly newspapers, a ladies' seminary, an opera house, and churches.

GLINKA, MICHAEL IVANOVITCH, 1804-57; a Russian composer. His thorough musical education did not begin until the year 1830, when he went abroad and staid for three years in Italy, to study the works of old and modern Italian masters. His thorough knowledge of the requirements of the voice may be connected with this course of study. His training as a composer was finished under Dehn, the celebrated contrapuntist, with whom Glinka stayed for several months at Berlin. In 1833 he returned to Russia, and devoted himself to operatic composition. On Nov. 27, 1836, took place the first representation of his *Life for the Czar*. This was the turning point in Glinka's life—for the work was not only a great success, but in a manner became the origin and basis of a Russian school of national music. Subject and music combined to bring about this issue. The story is taken from the invasion of Russia by the Poles early in the 17th c., and the hero is a peasant who sacrifices his life for the czar. Glinka has wedded this patriotic theme to inspiring music. His melodies, moreover, show distinct affinity to the popular songs of the Russians, and for that reason the term "national" may be justly applied to them. His appointment as imperial chapel-master and conductor of the opera of St. Petersburg was the reward of his dramatic successes. His second opera, *Ruslan and Lyudmila*, founded on Poushkin's poem, did not appear until 1842, but in the meantime he wrote an overture and four *entre actes* to Kukolnik's drama *Prince Kholmisky*. In 1844, he went abroad for a second time, and lived chiefly in Paris and Spain. On his return to St. Petersburg he wrote and arranged several pieces for the orchestra, amongst which the so-called *Kamarinskaya* has achieved popularity beyond the limits of Russia. He also composed numerous songs and romances. In 1857 he went abroad for the third time, and died suddenly at Berlin.

GLIOMA (Gr. glue), a tumor arising from the delicate connective tissue which holds together the nerve substance, either of the brain or other parts, and which has a gummy or glutinous consistency. Its usual seat is the brain or retina. See Tumors.

GLISSON, OLIVER S., b. Ohio, 1809; an officer in the U. S. navy. He was a midshipman in 1826, a lieutenant in 1837, a commander in 1855, a capt. in 1862, a commodore in 1866, a rear-admiral in 1870, and retired the next year. He commanded the *Porchatan* during the Japan expedition under commodore Perry.

GLOBULINE, or **GLOBULIN**, and **GLOBULINS**. Globuline, as it was spelled until recently, was considered in the earlier stages of scientific physiology the proteine principle of the red blood corpuscles. According to an analysis of Lehmann, it constitutes about 282 parts in 1000 of the blood globules, water constituting 688 parts, the remainder being composed of hæmatine, 17 parts; alkaline salts, 8 parts; with some fatty and extractive matter. This globuline is insoluble in the plasma of the blood, but is soluble in water and diluted blood. Rollet, by alternately freezing and thawing blood and repeating the operation several times, caused the hæmatine to separate from the red corpuscles. By this operation the blood loses its opacity, and the decolorized globules

are seen floating in the darkly colored though transparent serum. Views in regard to the constitution of the red blood corpuscles have undergone considerable change within the last twenty years, different modes of analysis having been employed to separate the organic constituents. This globuline of the older physiologists is now considered as a constituent of *haemoglobin*, which is the proteid substance united with the hæmatine (see HÆMOGLOBIN). The proteid which is precipitated when a solution of haemoglobin is exposed to the air, though belonging to the globulin family, has characteristics of its own. Preyer calls it *globin*. It contains no trace of mineral matter, and therefore, when burned, yields no ash. What are now called globulins constitute a family. To understand their relations to other proteine bodies, see PROTEIDS. These globulins are native proteids which differ from albumins in not being soluble in distilled water, needing for their solution a minute portion of a neutral salt, such as chloride of sodium (common salt), differing in this latter respect from the albumins, but are like them in not being soluble in distilled water. The globulins are soluble in dilute acids and alkalis, being changed respectively into acid-albumin and alkali-albumin. The globulins are named as follows:

1. *Globulin*, called also *crystallin*. If the crystalline lens of the eye is rubbed together with fine white sand, digested with water, and filtered, the filtrate will contain three proteids. If carbonic acid gas is now passed through the clear solution, a copious precipitate of *globulin* will take place. In its general behavior globulin much resembles *para globulin* and *fibrinogen*. It is readily precipitated on the addition of alcohol. It resembles vitellin in not being precipitated by saturated solution of chloride of sodium.

2. *Paraglobulin* or *fibrinoplastin*. When blood serum is diluted with 10 parts of water, and carbonic acid gas is rapidly passed through it, a flocculent precipitate is formed, which becomes granular, and easily separable by decantation or filtration. It should be washed with water containing carbonic acid to prevent redissolving. A more complete separation from serum may be effected by saturation with sulphate of magnesia. This yields, according to Hammarsten, about 4.565 parts in 100; but the amount varies in different animals. A characteristic test of paraglobulin is that it produces fibrin when added to many pathological fluids, such as that of the transudations in hydrocele, pericarditis, peritonitis, and pleuritis. Paraglobulin occurs chiefly in blood serum, but is also found in the white corpuscles, in connective tissue, cornea, aqueous humor, lymph, chyle, and serous fluids.

3. *Fibrinogen*. This body much resembles paraglobulin in its behavior generally, but the two differ in regard to coagulation by heat. In a weak solution of chloride of sodium, fibrinogen coagulates at from 125° to 131° F., while paraglobulin requires for coagulation a temperature of 154° to 158°. The characteristic test for its presence is the formation of fibrin when its solution is added to a solution of paraglobulin and fibrin-ferment. Fibrinogen occurs in blood, chyle, and various transudations.

4. *Myosin*. This form of globulin is the chief constituent of dead, rigid muscle. If a dead muscle, from which all fat, tendon, connective tissue, etc., has been removed, is rendered bloodless by a saline injection, and then cut fine and washed with water, when the washing has been continued until no proteid can be detected in the fluid, a large portion of the muscle will remain undissolved; but it will become a viscid mass if treated with a ten per cent solution of chloride of sodium (common salt). If this be placed upon a filter, a filtrate will slowly separate, and if it be allowed to drop into a large quantity of distilled water, a white flocculent precipitate will result, which is *myosin*. It is not as soluble as paraglobulin. It coagulates at a temperature of 131° to 140° F. In some of its reactions it resembles fibrin.

5. *Vitellin*. This is the chief proteid constituent of the yolk of egg, from which it may be obtained as follows: The yolk is treated with ether repeatedly till no coloring matter is extracted, when the residue is dissolved in a ten per cent solution of chloride of sodium, and filtered. The filtrate, when added to an excess of water, causes a precipitate of *vitellin* and some other matters, from which it may be separated by alcohol, which coagulates the vitellin. It is a white, granular body, insoluble in water, but very soluble in dilute solution of chloride of sodium, much more so than myosin. It coagulates between 158° and 176° F. A saturated solution of chloride of sodium causes no precipitate. In yolk of egg vitellin is always associated with lecethin (q.v.), probably in combination. Before it is freed from this body, vitellin possesses properties considerably differing from those of the other proteids.

GLO'RIA (*ante*) is the designation given to the words and the music of several doxologies: 1. *Gloria in excelsis*, named from its first words, which are the Latin for *Glory be to God on high*. It is called the *greater doxology*, to distinguish it from the *Gloria Patri*; also the *angelic hymn*, because the first part of it was sung at Bethlehem by the heavenly host. The authorship of the latter part is uncertain, though some have ascribed it to Telesphorus, bishop of Rome, about 139 A.D. It has been used in the eastern church more than 1500 years; and in the church of England more than 1200. It is placed at the beginning of the communion service in the Roman missal, and at the close of it in the rituals of the Anglican, Protestant Episcopal, and Methodist Episcopal churches. 2. *Gloria Patri*, the *minor doxology*, named also from its first words, which are the Latin for *Glory be to the Father*. In the earliest age of Christianity there was

no general form of doxology, but each minister and church offered it in varied language, as occasion prompted, ascribing honor and glory to the Father only, to the Son only, or to both. With the rise of Arianism, attention was drawn to the advantage of precision and uniformity, and the formula, *Glory be to the Father, and to the Son, and to the Holy Ghost*, became general. To this the western church added *As it was in the beginning, is now, and ever shall be, world without end*. A modification sometimes used by Unitarians is, *Glory be to the Father, through the Son, and by the Holy Ghost*. For direct praise, and for a leading recognition of the oneness as well as of the trinity of God, the form has been suggested, *Glory be to thee, O God! the Father and the Son and the Holy Ghost*. 3. *Gloria tibi* are the first words of a still briefer form, *Glory be to thee, O Lord!* which is used at the end of sentences or psalms.

GLORY PEA, a plant of the genus *clanthus* and order *leguminosæ*, found in the desert regions of Australia. The flowers grow in clusters from the axils of the leaves, and are peculiar in form and rich in color. The petal of the flower is in the form of an elongated shield, and of a brilliant scarlet color, with a central boss of dark brown.

GLOUCESTER, a co. in s.w. New Jersey, on the Delaware river; about 300 sq.m.; pop. '80, 25,886. The surface is level, and for the most part covered with pine forests. It is intersected by the West Jersey railroad. Co. seat, Woodbury.

GLOUCESTER, a co. in e. Virginia, on the Chesapeake bay and York river; 280 sq.m.; pop. '70, 10,211—5,299 colored. The surface is level and the soil productive. Co. seat, Gloucester Court-house.

GLOUCESTER, a co. in n.e. New Brunswick, on the gulf of St. Lawrence and bay Chaleurs; 1684 sq.m.; pop. '71, 18,810, of whom about two thirds were of French origin. The surface is rough, with many hills, separated with fertile valleys. The county is crossed by the Intercolonial railway. Ship-building, fishing, and other trade by sea are among the chief employments.

GLOUCESTER CITY, in Camden co., N. J., on the Delaware river, connected by ferry with Philadelphia, and accessible by two railroads; pop. '80, 5,347. The principal business is manufacturing.

GLOVERSVILLE, a village in Fulton co., N. Y., the n. terminus of the Fonda, Johnstown, and Gloversville railroad, which connects at Fonda with the N. Y. Central; 53 m. n.w. of Albany; pop. '80, of Johnstown township, which includes Gloversville, 16,626. It contains over 150 glove manufactories, and produces two-thirds of all the buckskin and kid gloves made in the United States. There are also manufactories of glove patterns, organs, railroad lamps, carriages, kid and other leather machines, and two large foundries. There are 6 churches and 2 national banks. A horse-railroad connects the village with Johnstown, and there are waterworks and gas.

GLÜMER, ADOLF VON, b. 1814; a Prussian officer. In 1866 he took part as a major-gen. in the war against Hesse, Hanover, and the southern German states. He was prominent in the Franco-German war, especially at the battle of Saarbrücken. He was also in the battle of Metz, was wounded at Nuits, and was conspicuous in other engagements.

GLYCON, the maker of the colossal statue known as the Farnese Hercules, a figure of the hero leaning on his club. It was doubtless brought to Rome in the time of Caracalla, and was found a long time afterwards in his baths.

GLYNN, a co. in s.e. Georgia, bordering on the ocean and bounded on the n.e. by the Altamaha river, intersected by the Brunswick and Albany, and the Mason and Brunswick railroads; 330 sq.m.; pop. '80, 6,497—4,303 colored. It is level, and much of the land consists of sandy barrens and swamps. The chief productions are sea island cotton and rice. Co. seat, Brunswick.

GLYPTODON (from the fluted character of its teeth), a gigantic fossil mammal, belonging to the order EDENTATA, and related to the *megatherium* and *mylodon*, also closely allied in form and structure to the modern as well as ancient armadillos. The first notice of this fossil animal was published by Cuvier, in 1823, in an extract of a letter addressed by the curé of Montevideo to M. August St. Hilaire, describing several huge fossil bones, and portions of tessellated bony armor. Cuvier supposed them to belong to the *megatherium*, remarking that that animal had pushed its analogies with the armadillo so far as to be covered like them with a scaly cuirass. The living families of *daspidiæ* and *myrmecophagiæ* of South America were represented in the same geographical area in pliocene and post-pliocene times by many interesting types, most of which, though representatives of those now living, differed from them in points of generic importance, while many were of comparatively gigantic proportions. The *glyptodon* differs from the *megatherium* in the number and form of its teeth, and from the armadillos in the form of the lower jaw, and in the presence of a long process descending from the zygoma; but in these respects it resembles the *megatherium*. Four species of *glyptodon* have been described by prof. Owen, the largest of which is *glyptodon clavipes*. The back and sides were covered by an armor or "carapace," of thick polygonal bony plates, which were dermal ossifications or scales, to the number of 2,000 or more. The head was also covered with a helmet of similar construction, and the tail was inclosed

in a cylindrical casing of similar polygonal plates, which were, as a rule, nearly hexagonal. The carapace formed a massive dome for the support of which the skeleton was specially adapted. Thus, the last cervical and first two dorsal vertebrae are ankylosed to form a single bone, which articulates by a hinge joint with the next dorsal. The sacral and caudal vertebrae form a bony mass, and the illia are enormous. Unlike the living armadillos, the *glyptodon* has no movable bands in its armor, and therefore could not, like them, roll itself up. The animal had no canines, but there were eight molars on each side of each jaw. The feet were massive, the ungual phalanges short, compressed, and hoof-like, the fore feet being tetradactylous, and the hind feet with four or five toes. The carapace of the glyptodon in the royal college of surgeons in London has the following dimensions: length 5 ft. 7 in. following the curve of the back, in a straight line 4 ft. 8 in.; breadth over curve, 7 ft. 4 in.; in a straight line, 3 ft. 2 inches. The tail was 18 in. long, and 14 in. in circumference at the base. The dimensions of the glyptodon in the museum of natural history of Columbia college, New York, are as follows: entire horizontal length, from end of nose to tip of tail (of skeleton), 9 ft. 2 in.; length of carapace, following the curve, 6 ft. 9 in.; transverse of carapace, following the curve, 9 ft. 1 in.; horizontal breadth, from edge to edge of carapace (which is less than at the middle), 3 ft. 5 in.; length of head, 14 in.; depth of head from occiput to angle of lower jaw, 14 in.; circumference of tail at base, 4 ft. 5 in.; length of tail, 3 ft. 10 inches. The genus *Schistopleuron* comprises gigantic armadillos, which were contemporaries of the *glyptodon*. *Schistopleuron typus* was 8 ft. in length, including the tail, and the carapace was 3 ft. in height. No direct representative of the glyptodon is known to exist at the present day, but the true armadillos, having movable bands in their armor, have been found in the post-tertiary accumulations of the plains of South America, and also of the cave deposits of Brazil. Some of them belong to well-known living types, as *Dasypus*, *Xenurus*, and *Eutatus*, while others belong to extinct gigantic forms, as *Chlamydotherrium* and *Pachytherium*, the former of these two attaining to the size of the existing rhinoceros. The ant-eaters also, *Myrmecophagide*, are represented in the cave deposits of Brazil by the extinct *Glossetherium*. See ARMADILLO, ANT-EATER, and MEGATHERIUM.

GLYPTOTHEK, a building in Munich, built 1816-30, having a famous collection of sculptures, brought there by king Louis I. They are Greek, Roman, and Egyptian, with some of modern work. There are twelve halls in the building, each containing a distinct epoch in art.

GMELIN, JOHANN FRIEDRICH, 1746-1804; nephew of Johann George; professor of natural history and botany at Tübingen, and professor of medicine at Göttingen. He was the editor of the 13th edition of Linnaeus's *Systema Naturæ*, and published works of his own on natural history.

GMELIN, JOHANN GEORG, 1709-55; son of the chemist of the same name. Having taken his degree in medicine, he repaired to St. Petersburg, where in 1731 he was appointed professor of chemistry and natural history. In 1733, by order of the empress Anna, he joined Deslisle, G. F. Muller, and Behring in an expedition for the exploration of Siberia, which country was penetrated as far as the Lena. He returned to St. Petersburg in 1743. In 1749, he was chosen professor of botany and chemistry at Tübingen, where he died. Linnaeus named a genus of plants "Gmelina" in his honor.

GMELIN, SAMUEL GOTTLIEB, 1743-74, an eminent naturalist, nephew of J. G. Gmelin, was b. at Tübingen. He graduated there in 1763, went to St. Petersburg in 1767, and in 1768, with Pallas, Guldenshtadt, and Lapuchin, commenced a journey for the scientific exploration of the s.e. possessions of Russia. Having visited in succession the western districts of the Don, the Persian provinces, to the s. and s.w. of the Caspian sea, the regions of the Volga, and the e. borders of the Caspian, he, in 1774, was on his way back to St. Petersburg, when he was seized as a hostage by Usmei Khan, of the Kaitak tribe, through whose ill treatment he died.

GOA POWDER (also called *Araroba*, *crysarobin*, *pondu dr Goa*), a drug imported in the form of a yellowish powder, which on exposure to the air becomes darker, and which has been brought into notice by Dr. Fayer, of Calcutta, and others, as a remedy for ring-worm. It derives its name from the Portuguese colony of Goa, where it appears to have been introduced about the year 1852. In 1875, it was shown by Dr. Lima that the substance had been exported from Bahia to Portugal, where it found its way to the Portuguese colonies in Africa and Asia. The tree which yields it belongs to the genus *Andria*, of the natural order *Leguminosæ*, and has been named *A. Araroba*. It is met with in great abundance in certain forests in the province of Bahia, preferring low and humid spots. The tree is from 80 to 100 ft. high, and is furnished with imparipinnate leaves, the leaflets of which are oblong, about $1\frac{1}{2}$ in. long, and $\frac{1}{4}$ in. broad, and somewhat truncate at the apex. The flowers are papilionaceous, of purple color, and arranged in panicles. The Goa powder, or araroba, is contained in the trunk, filling crevices in the heartwood. To obtain it, the oldest trees are selected as containing the larger quantity, and after being cut down are sawn transversely into logs, which are then split longitudinally, and the araroba chipped or scraped off with the axe. During this process the workmen feel a bitter taste in the mouth; and great care has to be taken to prevent injury from the irritating action of the powder on the eyes. In this state,

i.e., mixed with fragments of wood, the Goa powder is exported. It is used in the form of an ointment made by rubbing together 40 grains of the powder, 10 drops of acetic acid, and an ounce of lard. This is smeared over the eruption once a day for several days. A tincture is sometimes used, applied with a brush, and over this a little lard may be rubbed. It is probable, however, that a properly diluted solution of carbolic acid, a remedy which has been used in conjunction with araroba, or Goa powder, is a more effective and agreeable remedy.

GOAT ISLAND, a little island of 70 acres just on the verge of Niagara falls, dividing the current where it plunges over the precipice. It is about 2,000 ft. from the Canadian and 900 from the American shore, and joined to the latter by a bridge.

GOBERT, NAPOLEON, 1807-33; a French philanthropist and soldier. For the promotion of the study of French history he left legacies to the French academy and to the academy of inscriptions, the income from which was to be distributed in annual prizes to the authors of the best works on that subject. The legacy amounts to 10,000 francs per year for each of the two academies, and has been so far distributed according to his request.

GODDARD, ARABELLA, b. France, 1836; noted as a pianist. She made her first public appearance in 1850. She has given concerts in most of the cities of Italy, Germany, France, and in Australia, the Sandwich islands, and the United States. She played at the great musical festival in Boston, Mass., in 1872.

GODERICH, the capital of Huron co., Ontario, on lake Huron, at the entrance of Maitland river and the terminus of the Buffalo and Goderich branch of the Grand Trunk railway; pop. '71, 3,954. It has a good harbor and steam communication with all lake ports.

GODFREY, THOMAS, d. 1749; a native of Philadelphia and a mathematician who made a valuable improvement in the quadrant, for which he received a reward of \$1,000 from the British royal society. His quadrant was the same in principle and application as the sextant.

GODKIN, EDWIN LAURENCE, b. Ireland, 1831; educated at Queen's college, Belfast. He came to the United States in 1856, and traveled through the southern states; afterwards studied law, and was admitted to the bar. He is now chief editor of the *Nation*, a weekly journal published in New York.

GODMAN, JOHN D., 1794-1830; b. Md; was one of the defenders of fort McHenry. He was professor in the medical college of Ohio, and in Cincinnati started the *Western Quarterly Reporter*. He was subsequently professor in Rutgers medical school in New York. He was the author of many articles in the *Encyclopedia Americana*; *American Natural History*; *Bell's Anatomy, with Notes*; *Anatomical Investigation*; and *Rambles of a Naturalist*.

GODON, SYLVANUS W., b. Penn., 1810; entered the navy and rose to be rear-admiral, retiring in 1871. He commanded the Powhatan at the battle of Port Royal, and the Susquehanna in the fort Fisher engagements.

GODWIN, MARY WOLLSTONECRAFT, 1759-97; b. England; became a teacher and governess; and in 1786 published *Thoughts on the Education of Daughters*; afterwards *Mary*, a novel; *Original Stories*, and translations from Lavater. Her most important work was a *Vindication of the Rights of Woman*. Having great sympathy with the ideas that instigated the French revolution she went to Paris, where she became the mistress of an American known as Imlay. He deserted her and William Godwin married her. She died in her 38th year in giving birth to a daughter who became the wife of the poet Shelley.

GODWIN, PARKE, b. N. J., 1816; educated at Princeton college, graduating in 1834, studied law and was admitted to practice, but preferred literary pursuits. He married a daughter of William Cullen Bryant, and from 1837, with occasional intervals, was for many years connected in an editorial capacity with the *New York Evening Post*. He edited in 1843-44 *The Pathfinder*, a literary journal, and was for some years a contributor to the *Democratic Review*. Of *Putnam's Magazine* he was for a considerable time the principal editor, and always a contributor. Two volumes of his critical and miscellaneous essays in this magazine have been collected under the title of *Out of the Past*. Besides these journalistic labors, he has translated and edited Goethe's *Autobiography*; *Zschokke's Tales*; *Undine Sintram and his Companions*, and compiled a *Cyclopædia of Biography*, and has written, among other works, *A Popular View of the Doctrines of Fourier Constructive Democracy*; and *Vala, a Mythological Tale*. Many years ago he began an elaborate *History of France* of which only the first volume has been published.

GOEBEN, AUGUST VON, b. Hanover, 1816; was in the Prussian military service in 1833, but afterwards joined the Carlists, and was wounded and taken prisoner. After the end of the Carlist war he was liberated, and on his return to Germany, wrote an account of his Spanish experiences. Re-entering the Prussian army, where he served on the staff, he took part in the campaign against the revolution in Baden, and became in 1855 chief of staff of the 6th army corps. In 1860, he was directed to accompany the army of the Spanish general O'Donnell, in the campaign in Morocco. In 1863 he

commanded the 26th brigade of infantry; the following year he was engaged in the war against Denmark, and became lieutenant and commander of the 13th division. At the head of this division he entered Hanover in 1866, and distinguished himself on several occasions. In the Franco-German war, as commander of the 8th army corps, he held an important and conspicuous position, and distinguished himself in the battles of Saarbrücken and Metz. In Jan., 1871, Goeben was appointed commander of the army of the north, and fought a decisive battle at St. Quentin (Jan. 19), when he defeated Gen. Faidherbe, and caused the disbanding of the French northern army. He is now in command of the 8th army corps, located in Rhenish Prussia, head-quarters at Coblenz.

GOENTOER, a volcano in the island of Java 100 m. s.e. of Batavia, about 7,000 ft. high, and in almost constant eruption.

GOES, HUGO VAN DER, lived in the latter part of the 15th c., a Flemish painter and the successor of Van Eyck. His greatest work is the *Crucifixion* in a church at Bruges.

GOETZ, HERMANN, 1840-76; b. Prussia, and at an early age became a musician and a student under Hans von Bülow. He is best known as the author of an opera founded upon Shakespeare's *Taming of the Shrew* produced at Mannheim in 1874 and successful all over Europe. He left an unfinished opera (concluded by a friend) called *Francesca da Rimini*.

GOFFE, WILLIAM, 1605-79; b. England; one of the officers in the parliamentary army and a judge on the trial of Charles I. After the restoration, he came to America and enjoyed the hospitality of gov. Endicott of Massachusetts. He was accompanied by his father-in-law, Edward Whalley. Rewards were offered for their arrest, and for years they were hiding in caves and other places of concealment in Connecticut. In 1675 at a religious service in Hadley, the Indians came upon the town, and were about to murder the whites when an old man with a long white beard suddenly appeared in the church, rallied the whites, and himself led the charge upon the red men, who were put to flight. In the moment of victory, Goffe—for he it was—disappeared and was never afterwards seen. This at least is the ancient tradition.

GOGRA. See GYROGRA, *ante*.

GOLD (*ante*). In no part of the world is gold found more widely diffused or in greater abundance than in the United States. It is found chiefly in two great belts, one the Appalachian, on the Atlantic slope, the other on the Pacific coast. The first of these belts extends from Virginia in a south-westerly direction through North Carolina, South Carolina, and Georgia, becoming narrower as it reaches Alabama and Tennessee. The belt is not continuous for the whole distance, but broken at many points. It sometimes expands to a width of 75 m., but is generally much narrower. In North Carolina, whose gold production is larger than that of any other state on the Atlantic slope, the metal is found in two parallel lines, each crossing the state in a s.w. and n.e. direction at a considerable distance from the other. The belt is divided also in a similar way in Georgia. The Appalachian belt shows itself also to a comparatively slight extent in Maryland, Pennsylvania, and Vermont, but in these states the gold is not found in quantities sufficient to pay the cost of obtaining it. It was not until 1824 that native gold found its way to the United States mints. From that time the supply grew more and more abundant until in five or six years it exceeded that from foreign sources. Until 1827, the supply came mainly from North Carolina, but after that considerable quantities were mined in South Carolina, Georgia, and Virginia. In 1837, branch mints were established at Charlotte, N. C., and Dahlonega, Ga. They were suspended in the time of the rebellion, but that at Charlotte has been since revived as an assay office. The discovery of gold in California led to an abandonment of many of the southern mines. The amount of gold from those mines deposited in the mints and assay offices of the United States up to June 30, 1873, was \$20,052,006. Of this amount \$1,631,612 came from Virginia, \$9,983,585 from North Carolina, \$1,378,180 from South Carolina, \$7,267,784 from Georgia, \$79,018 from Tennessee, and \$211,827 from Alabama. The deposits from the southern mines in 1873 amounted to \$158,958. It was known from a very early period that there was gold in California, but it was not until after the territory was annexed to the United States that the vast extent and richness of the supply was discovered. Since that day the development of the mines has been very rapid. At first the mining implements and methods were of the rudest sort, but as new discoveries were made and experience gained, these rude appliances were superseded, until now the business is prosecuted by means which science dictates and approves. Machines have been invented for separating the gold from the rocks in which it is embedded and for nearly every other mining process, and the work is prosecuted with unremitting energy and skill. Discovery has followed discovery until all the states and territories on the Pacific slope are seen to be rich in the precious ore. New mining settlements are springing up on every hand, population is rapidly augmenting, capital flows in abundance to every favorable point; and there are besides a great many places, too remote as yet from railway communication, where the precious metal is known to exist in great abundance. As the country becomes filled with an enterprising, wide-awake population, the now inaccessible places will be opened up and

developed. In short, the supply of gold w. of the Rocky mountains bids fair to hold out for ages to come, if it is not for ever inexhaustible. From 1848 to 1859, inclusive, the gold product of California is estimated at \$1,136,800,000; from 1860 to 1869 at \$299,800,000. During the latter period the product of the states and territories was \$254,950,000. Mr. John J. Valentine, the agent of Wells, Fargo & Co., who is understood to be thoroughly informed upon the subject, estimated the yearly production of gold from the whole Pacific slope from 1870 to 1879 inclusive, as follows: 1870, \$33,750,000; 1871, \$34,398,000; 1872, \$38,177,395; 1873, \$39,206,558; 1874, \$38,466,488; 1875, \$39,968,194; 1876, \$42,886,935; 1877, \$44,880,223; 1878, \$87,756,030; 1879, \$33,000,000. Total, \$382,309,823. This gives as the whole product of gold from the Pacific slope since the first discoveries in 1847, the sum of \$2,073,859,823. Gold has also been discovered in Alaska, and it may not be long perhaps before a tide of emigration will set in that direction. The new discoveries of gold made in the last few years are chiefly in Colorado and Dakotah, and in Mono co., Cal. The gold and silver in the world, exclusive of the unknown regions of the e., is believed to have been reduced, at the time of the discovery of America, to about \$170,000,000. Humboldt estimates the amount brought into Europe from the new world from 1490 to 1500 at \$260,000 annually. The importation was doubtless fully equal to this rate until 1521, when Mexico was conquered and a great increase at once began. The receipts of American gold in Europe for the first 300 years after Columbus's discovery are supposed to have been more than three times as great as those from other parts of the world. England long had a considerable supply from Wales. Hungary, Austria, and Russia contain extensive gold fields. The gold production of Italy and France is far less important. In China and Japan gold exists in great abundance in many localities, and the gold formations of eastern Siberia are very extensive. The annual gold production of Africa is probably not less than \$1,000,000 annually. Generally gold is found so mixed with rock and other substances that it can be detached only by severe labor, but it is occasionally found in nuggets of considerable size and in a nearly pure state. Some of the largest nuggets of which we have an account weighed from 37 to 233 lbs. Troy weight. During the last twenty-five years, considerable gold-mining has been conducted in Nova Scotia, the auriferous region being under the control of the queen, who is represented by the mining commissioner at Halifax, by whom it has been divided into mining districts. These districts are leased for 21 years, and a royalty is paid to the government on the gold extracted. There are 14 gold-mining districts, and the yield in 1876 was about 12,000 oz.

GOLDEN, the seat of justice of Jefferson co., Col., on Clear creek and the Colorado Central railroad, 16 m. w. of Denver; pop. 587. The town has a number of manufactures.

GOLDEN EAGLE, *Aquila Canadensis*, the typical eagle and imperial emblem of ancient Rome and Persia. It is generally of brown color, and about 3 ft. long.

GOLDEN HORDE, a force of Tartars who invaded Kiev and Moscow, destroyed several other cities, and in 1241 massacred a Magyar army. Their first leader was the grandson of Ghenghis Khan.

GOLDHILL, a t. in Storey co., Nev., on the Virginia and Truckee railroad, 1 m. s. of Virginia City, and nearly 1½ m. above the level of the sea; pop. 4,311. Silver-mining is the chief business.

GOLDSBOROUGH, **LOUIS MALSHEORBES**, 1803-77, b. D. C.; went into the navy; took part in the Mexican war; was superintendent of the naval academy; in 1861 commanded the Burnside expedition to North Carolina; rear-admiral in 1862, and afterwards in command of the Washington navy yard; retired in 1873.

GOLDSCHMIDT, **HERMAN**, 1802-66; a German painter and astronomer, was the son of a Jewish merchant, b. at Frankfort. He for ten years assisted his father in his business; but, his love for art having been awakened while journeying in Holland, he began the studying of painting at Munich under Cornelius and Schnorr, and in 1836 established himself at Paris, where he painted a number of pictures of more than average merit, among which may be mentioned the "Cumæan Sibyl," an "Offering to Venus," a "View of Rome," the "Death of Romeo and Juliet," and several Alpine landscapes. In 1847 he began to devote his attention to astronomy; and from 1852 to 1861 he discovered fourteen asteroids between Mars and Jupiter on which account he received the grand astronomical prize from the academy of sciences. His observations of the protuberances on the sun, made during the total eclipse on July 10, 1860, are included in the work of Mädler on the eclipse, published in 1861.

GOLDSMITHS' COMPANY, one of the richest guilds in England, formed at first for the protection of gold and silver artifices, and now intrusted with the assaying and stamping of all standard gold. Antiquarians assert that the Goldsmiths' company must have been formed in the early Anglo-Saxon times. In the reign of Henry II. (1180) it is mentioned with other guilds as existing without license, and in 1236 was rendered notorious by a virulent quarrel with the merchant tailors, which was quelled only by the interference of the legal authorities. Fifteen charters have at different times been awarded to this guild, and in 1396 it was incorporated as a company, while the arms,

crest, and supporters were added in 1571. Privileges have been constantly extended to it, and since the time of James I., when the last charter was granted, its wealth and importance have steadily increased. The company's buildings are situated in the rear of the general post-office. The site occupied belonged to a brother of the bishop of London in 1316, and was made over to the guild by him. It is uncertain when the buildings were commenced, but the first stone of the hall itself was laid by sir Brue Barentyn, 1407. During the great fire of London it sustained serious damage, but was repaired, and was completed in 1669. The charities in connection with it are large, and number over fifteen, its revenues are enormous, and increase yearly, while the value of the property owned by the company is incomputable.—Among many treasures left to it by will are the coronation cup used at queen Elizabeth's accession, and many rare and exquisite paintings, statues, etc. Hayter's portrait of queen Victoria is a late acquisition. The guild possesses the right of assaying all articles made of gold and silver, for which it receives from the manufacturers fees exceeding in value £6,000 per annum. In addition to this the government pays the company a large salary for collecting excise dues and paying them into the bank. The method of testing gold by assay is performed by scraping off a portion of the metal and subjecting it to an analytical test, and the article is stamped in accordance with the absolute quantity of pure metal which it contains. Assay marks are variously used. The Goldsmiths' company possesses five: the first, an impression of the sovereign's head, indicating the reign; the second, the lion passant, which is the standard mark, and dates back to queen Elizabeth, or possibly to Henry VIII.; the price mark referable to the enactments of William III.; and the remaining two, a leopard's head, and the maker's mark, both of uncertain period. In addition to these assay marks, in order to stamp the date exactly and correctly, the company have introduced the "date" letter. Twenty letters of the alphabet are used for this purpose, the series commencing with the first, omitting Y and ending with U. The letter is changed yearly, and the shape of the letter every twenty years. Thus, from 1796 to 1816, the ordinary letters were in vogue, and the letter D would mean 1799, while, as the smaller letters came into use at the end of the twenty years, or 1816, a small d would give 1820 as the year of manufacture. Then, in the twenty years to 1856 old English capitals were employed, giving place in turn, at the expiration of that time, to small old letters. The earliest known letter date was used in 1438.

GOLD STICK, superior officers in the English body-guard, and captains in the corps of gentlemen-at-arms; so called because on state occasions they carry a gilded baton.

GOLIAD, a co. in s.w. Texas on the San Antonio river, intersected by the San Antonio and Gulf railroads; 900 sq.m.; pop. '70, 3,628—876 colored. The surface is level and the soil productive; the chief productions are corn and cotton. Co. seat, Goliad.

GOLIUS, JACOBUS, 1596–1667; a Dutch orientalist who studied at Leyden, where in Oriental languages he was the most distinguished pupil of Erpenius. In 1622, he accompanied the Dutch embassy to Morocco, and on his return he was chosen to succeed Erpenius. In the following year he set out on a Syrian and Arabian tour from which he did not return until 1629. The remainder of his life was spent at Leyden, where from that date he held the chair of mathematics, as well as that of Arabic, until his death.

GOLOVNIN, VASILY MIKHAILOVICH, 1776–1831; a Russian vice-admiral; educated in the Cronstadt naval school. From 1801 to 1806 he served as a volunteer in the English navy. In 1807, he was commissioned by the Russian government to survey the coast of Kamtchatka and of Russian America, including also the Kurile islands. Golovnin sailed around the cape of Good Hope, and Oct. 5, 1809, arrived in Kamtchatka. In 1810, whilst attempting to survey the coast of the island of Kunashir, he was seized by the Japanese, and retained by them as a prisoner until Oct. 13, 1813, when he was liberated, and in the following year he returned to St. Petersburg. Soon after this the government planned another expedition, which had for its object the circumnavigation of the globe by a Russian ship, and Golovnin was appointed to the command. He started from St. Petersburg on Sept. 7, 1817, sailed round cape Horn, and arrived in Kamtchatka in the following May. He returned to Europe by way of the cape of Good Hope, and landed at St. Petersburg, Sept. 17, 1819.

GOLTZ, BOGUMIL, 1801–70; a polish humorist and satirist. In 1847 he gave to the world the first fruits of his studies and reflections in the charming poetic *Buch der Kindheit*, in which he delineates the incidents and impressions of his own childhood with a tender feeling akin to that of Jean Paul. The dates which he gives in this narrative are inconsistent with those which he furnished for the memoir in Brockhaus's *Conversations-Lexikon*, and a chronological difficulty is thus created which perhaps it may not be possible to solve. The *Buch der Kindheit* was followed by a satirical and polemical epistle against Ronge and the friends of enlightenment, which he entitled *Deutsche Entartung in der lichtfreundlichen und modernen Lebensart*. For the purpose of enlarging his experience of men, and amassing stores of material for his art as humorist and reformer of human life and society, he undertook a course of extensive travels,

visiting Germany, France, England, Italy, and Egypt. In 1850 he published *Das Menschendaseyn in seinen uralten Zügen und Zeichen*. This was followed by another poetically conceived work on his own early life, entitled *Ein Jugendleben; Biographisches Idyll aus Westpreussen*, and by *Ein Kleinstädter in Ägypten*. In his next work, *Der Mensch und die Leute*, he especially displays his peculiar powers in profound and acute sketches of various races of men. His *Die Deutschen*, consisting of a series of studies on the history and peculiarities of the genius of the Germans, appeared in 1860. His other works are *Zur Charakteristik und Naturgeschichte der Frauen, Typen der Gesellschaft, Die Bildung und die Gebildeten, Vorlesungen*, and *Die Weltklugheit und die Lebensweisheit mit ihren correspondirenden Studien*.

GOMER, the eldest son of Japhet, and an ally of Gog, has usually, since Calmet's time, been identified with those Cimmerii who, originally inhabiting the districts to the n.e. and n. of the Black sea and sea of Azof, at an early period began to penetrate as far as Asia Minor, and in the 7th c. b.c. overran Lydia, though without leaving permanent traces of their presence. This identification, however, is to be met with in none of the older writers. Josephus understands the Galatians of northern Phrygia to be intended; and Gimmeri or Ganir, was in the language of the ancient Armenians, a usual designation for their neighbors the Cappadocians. It is not impossible that an intimate ethnological connection between the Cappadocians of Kephallion and the Cimmerians of Homer may ultimately be established; but meanwhile it is important to observe that the three sons of Gomer, as named in Gen. x. 2, admit of a tolerably definite localization. Ashkenaz, who has sometimes been identified with the Germans, is almost certainly the same as the Aseanians, a very ancient tribe of northern Phrygia. Riphath has nothing to do with the Rhipæan mountains, with the Carpathians, or with Niphates, but, as Josephus has pointed out, is to be identified with Paphlagonia; as Bochart has shown, the name probably survives in the designation of a river in Bithynia, and in a district situated on the Thracian Bosphorus. Although Togarmah is by Josephus interpreted as equivalent to Phrygia, there is a considerable amount of ancient testimony in favor of its identification with Armenia. It is possible that the same root is actually at the basis of the two words; at all events the connection is assumed in the account which the Armenians themselves give of their legendary history.

GOMEY, ESTEVAN, d. 1525; a Portuguese explorer who accompanied Magellan as pilot. He mutinied, and carrying the crew with him put the captain in irons, and returned to Spain in command of the ship. It is supposed that in 1524 he set sail from Corunna, Spain, to search for a western passage to the Spice islands; that he struck the American coast at the point known as New York bay; that he ascertained the course of the Hudson river, and continued his course as far n. as the coast of Maine.

GOMOR, a co. in n. Hungary; 547 sq. m.; pop. '69, 103,639. It has a mountainous surface, and is intersected by navigable rivers. The inhabitants occupy themselves in cattle herding, and mining. The largest town is Rosenau.

GONDA, a district of Oudh, lying between 26° 46' and 27° 50' n., and 81° 35' and 82° 48' e., bounded on the n. by the lower range of the Himalayas, on the e. by Basti district, on the s. by Fyzabad and Bara Banki, and on the w. by Bharaich, and having an area of 2,824 sq. miles. Gonda presents the aspect of a vast plain with very slight undulations, studded with groves of mango trees. The surface consists of a rich alluvial deposit which is naturally divided into three great belts known as the "tarai" or swampy tract, the "uparhār" or uplands, and the "tarhār" or wet lowlands, all three being marvelously fertile. Several rivers flow through the district, but only two, the Gogra and Rāpti, are of any commercial importance, the first being navigable throughout the year, and the latter during the rainy season. The country is dotted over with small lakes, the water of which is largely used for irrigation. The country contains tigers, leopards, bears, wolves, and deer. Large game birds are plentiful.

GONDA, the chief town and administrative head-quarters of Gonda district, in 27° 8' n., and 82° 1' east. The site on which the town now stands was originally a jungle, in the center of which was a cattle fold (Gontha or Gothān), in which the cattle were inclosed at night as a protection against wild beasts, and from this the town derived its name. The place was formerly celebrated for the manufacture of shields; now it is neither of commercial nor religious importance. The town contains a civil station, dispensary, school, literary institute, court-house, and jail. Pop. 13,722.

GONDS, a race dwelling in the uplands of the central provinces of India, or Gondwana. They are hardy and brave and enterprising, but not far advanced in civilization; have brown skins, and straight black hair. In stature they are much below the average, the greater portion of males seldom exceeding 5 ft. in height. From general appearance it is supposed they are related in some degree to the Dravidian races who dwell further south. According to the census of 1872, the Gonds in central India numbered 2,041,276. Some of them are employed in agriculture, but a large proportion maintain existence upon fruits and animals. They possess no written language; many of them can speak Hindustanee, but in ordinary parlance they use only their own dialect. They are pantheistic in religion. Wives are bought, and polygamy is tolerated, but

little practiced. Every kind of labor except hunting is undertaken by the females, the men devoting themselves to the chase.

GONZAGA, a t. in Italy, in the province of Mantua; pop. 17,526. Formerly it was a strong military post, but is chiefly known as the home of the famous Gonzaga family, who ruled in Mantua in the 14th and 15th centuries.

GONZAGA, THOMAS ANTONIO COSTA DE, 1744-1809; the "Portuguese Petrarch." Having completed his law studies at the university of Coimbra, which he attended from 1763 to 1768, Gonzaga in the latter year returned to Brazil, and after having acted for some years as local magistrate at Beja and elsewhere, he was appointed judge at Villareica, in the province of Minas, where he highly distinguished himself by administrative ability and by the many excellences of his private character. Before this time he developed some talent for versification, and his literary tastes soon brought him into intimate association with Claudio Manoel, Alvarenga Peixoto, and other writers of the so-called Minas school; but the love which inspires the poet did not, in his own opinion at least, come upon him until he had made the acquaintance (about 1788) of D. Maria Joaquina Dorothea de Seixas, the *Marilia de Dirceu* to whom all his extant poems relate. He had just been nominated a member of the supreme court of Bahia, and was on the eve of his marriage, when discovery was made of the treasonable plot of Minas, and he was arrested on suspicion of having been implicated in it. On merely circumstantial evidence, and that of a very inconclusive kind, he was condemned, 1792, to banishment for life to Pedras de Angóche, a sentence which was afterwards commuted to one of ten years exile at Mozambique. Here he made some effort to practice as an advocate, but he never recovered from the depression with which his cruel lot had affected him. He was attacked by nervous fever which undermined his health, and after years of increasing melancholy, which occasionally alternated with fits of acute mania, he died.

GONZALES, a co. in s. Texas on the Guadalupe river, traversed by the Galveston, Harrisburgh and San Antonio railroad; 1050 sq.m.; pop. '80, 14,840—4,865 colored. It has an undulating surface and the soil is fertile. There are valuable deposits of coal and iron. Productions, corn, and cotton. Co. seat, Gonzales.

GOOCHLAND, a co. in central Virginia, on the James river; 275 sq.m.; pop. '70, 10,313—6,601 colored. Surface undulating, and soil tolerably fertile; chief productions, wheat, corn, oats, and tobacco. Co. seat, Goochland Court House.

GOODALE, ELAINE and DORA READ, daughters of Henry S. and Dora H. Read. The elder sister, Elaine, was born at "Sky Farm," on Mt. Washington, Berkshire co., Mass., 1833, and Dora Read at the same place, 1866. Both parents have contributed to leading magazines, and shown considerable literary ability. The remarkable precocity, however, displayed by their two daughters in their earliest poetical productions is an interesting problem for psychological speculation, and their artistic development will be watched with interest. At eight years of age, Elaine began the publication of a little paper, called *Sky Farm Life*, in which their poems appeared from month to month. In 1877, the parents consented to the publication of some of the verses in *St. Nicholas*. The sisters have since been frequent contributors to that magazine, the *Springfield Republican*, *Good Company*, and have had an occasional poem in *Scribner's Monthly*. Their poems have been published in three volumes—*Apple Blossoms*, with portraits of Elaine and Dora (1878); *In Berkshire with the Wild Flowers* (1879); and *All Round the Year* (1880).

GOODELL, WILLIAM, an American editor and philanthropist, b. near the close of the 18th c., d. in Janesville, Wis., in 1879. As a young man, living at the time in Providence, R. I., he took part in the discussion of the Missouri question in 1819-20, opposing the admission of the territory to the union as a slave state. At the beginning of the temperance movement in 1826-27, he became one of its earnest champions, and for several years edited the *Genius of Temperance*, and other periodicals of a similar character. He was one of the earliest to enlist in the anti-slavery movement, and the editor for a time of the *Emancipator*, the organ of the American anti-slavery society in New York. He subsequently conducted for several years the *Friend of Man*, the organ of the New York state anti-slavery society, in Utica. Later still he founded successfully in New York *The Radical Abolitionist* and *The Principia*, which he devoted mainly to the task of demonstrating that slavery in the United States had no legal or constitutional basis, and that courts of justice were not only not bound to pay it any respect, but had the right in all cases where they had jurisdiction, to treat it as a crime and assert the freedom of its victims. He held this view in common with Gerrit Smith, and many other eminent men of the period, and brought to its support abilities of a high order both as a writer and speaker. In 1851, he published *The History of Slavery and Anti-Slavery*, a work of much careful research, which will be found valuable to future historians of the American anti-slavery movement. He was a deeply religious man, belonging theologically to the school of Hopkins and Emmons. He was licensed to preach, but not ordained.

GOODELL, WILLIAM, D.D. (1792-1867); a Congregational minister and missionary, b. at Templeton, Mass., educated at Phillips academy, Andover, Dartmouth college, and Andover theological seminary. Having been accepted as a missionary by the

American board, he traveled from New England to Alabama as an agent for raising funds, and visited the missions among the Choctaws and Cherokees east of the Mississippi. At the close of 1822 he sailed for Malta, and thence the next year to Beyroot, where he aided in establishing a station which has become eminently important as the center of the Syrian mission. The year following he commenced the study of Armeno-Turkish with the assistance of an ex-bishop of the Armenian church, Yakob Aga, and of a bishop, Dionysius Carabet, who afterwards joined the mission church. Thus unconsciously to himself he was preparing for his great work among the Armenian nation. In 1828, on account of threatened war between England and Turkey, the missionaries removed to Malta, where Mr. Goodell labored in preparing and printing books for the mission; until, in 1831, the way having been opened by the destruction of the Turkish fleet at Navarino, he went to Constantinople, where he commenced the Armeno-Turkish mission. During his missionary life he and his equally devoted wife cheerfully endured many trials and perils, and were compelled by fire, pestilence, political disturbance, war, persecution, extortion, and governmental interference to pack up their household goods and move their residence 33 times in 29 years. Unconquerable in effort, courteous in manner, of ready tact and resistless wit, he acquired great influence over the intelligent nation for whose good he worked; and won the respect and confidence of European ambassadors, ecclesiastical dignitaries, Armenian bankers, and other leading men. Those even who opposed his work were constrained to honor the worker. Few men equaled him in his wonderful power of doing good without giving offense, and of commending piety to the world. One of his chief labors was the translation of the Bible into Armeno-Turkish, in making and revising which he spent 20 years. In 1865, after 43 years of enthusiastic toil, he returned to the United States, and died in Philadelphia at the residence of his son.

GOODHUE, a co. in s.e. Minnesota, intersected by the Milwaukee and St. Paul railroad and bounded on the n.e. by the Mississippi and lake Pepin; 750 sq.m.; pop. '80 29,651. The surface is varied and the soil fertile. Chief productions, wheat, corn, barley, and butter. Co. seat, Red Wing.

GOODRICH, CHANCEY ALLEN, D.D., son of Elizur, 1790-1860; b. Conn.; graduated at Yale, where he was afterwards tutor, studied theology, and was ordained pastor of a Congregational church at Middletown, Conn., in 1816. In 1817 he became professor of rhetoric at Yale college, and in 1839 professor of pastoral theology. In 1820 he was elected president of Williams college, but declined. While tutor he published a Greek grammar which was widely used, and later Greek lessons, and Latin lessons. He superintended the abridgment of the dictionary of Dr. Noah Webster (his father-in-law), and the revision of that work in 1847 and 1859. For many years he edited the *Quarterly Christian Spectator*, and he published a volume entitled *Select British Eloquence*, containing critical sketches of distinguished orators of Great Britain in the last two centuries.

GOODRICH, ELIZUR, D.D., 1734-97; b. Conn.; graduated at Yale, where he was a tutor; was ordained a pastor of the Congregational church, Durham, Conn. He was a mathematician and astronomer.

GOODRICH, ELIZUR, LL.D., 1761-1849; b. Conn.; graduated at Yale, where he was a tutor. He was a lawyer, a member of congress, county and probate judge, mayor of New Haven, and professor of law in Yale college.

GOODRICH, FRANK BOOT, b. Boston, 1826; son of Samuel Griswold Goodrich; graduated at Harvard, and was for some time the Paris correspondent of the *New York Times*, under the signature of "Dick Tinto." In 1854 he published *Tri-colored Sketches of Paris*, in later years *The Court of Napoleon*, *Man upon the Sea*, and *Women of Beauty and Heroism*.

GOODRICH, SAMUEL GRISWOLD, 1793-1863; b. Conn. He was a book publisher in Hartford and Boston. In the latter city he was the editor of the *Token*, an illustrated annual. He is best known as Peter Parley, a nom de plume which he assumed in writing a series of books for children, which extended through more than a hundred volumes. He was U. S. consul at Paris, where he published in 1852 a statistical work on the United States. Among his works are *The Outcast and Other Poems*; *Fireside Education*; *Sketches from a Student's Window*; *Recollections of a Life-Time*; and *Illustrated Natural History of the Animal Kingdom*.

GOOD TEMPLARS, INDEPENDENT ORDER OF, a secret society established in central New York in 1851, mainly through the energy and skill of Nathaniel Curtis, reformed by the Washingtonians. Its basis is total abstinence from intoxicating liquor as a beverage, and the prohibition of its manufacture, importation, and sale for that purpose. It has a liberal financial basis, secured by quarterly pass-words obtainable only on payment of dues. It aims to diffuse its principles through the press, lectures, and meetings. The subordinate lodges, averaging each 100 members, hold weekly meetings; the county or district lodges are composed of delegates from the subordinate lodges, and meet monthly or quarterly; the supreme representative body, or the international grand lodge, or most worthy grand lodge of all the world, meets triennially. Each state, kingdom, or other political division has its right worthy grand lodge, which

meets annually, and elects representatives to the supreme body. There are degrees and methods of recognition. The first lodge in England was formed in Birmingham, May, 1868; the second in Glasgow, Scotland, 1869. In 1874 there were in the United Kingdom 3,743 lodges, and 210,255 members. In the United States and a few foreign places, exclusive of England, there were, Jan. 31, 1880, 5,965 lodges, and 254,993 members. There are now 64 grand lodges in the United States, England, Canada, Australia, New Zealand, Madagascar, and India, and the total number of members is estimated at 617,733. Nearly 200,000 children in the order of good templars are pledged to total abstinence. Since the origin of the society, 2,900,804 persons have become members, of whom 290,000 had been inebriates, and of these 145,000 have kept the pledge and been active laborers in the reform.

GOODWIN, DANIEL RAYNES, D.D., LL.D., b. 1811; graduated at Bowdoin college; became a pastor in the Protestant Episcopal church; was professor of modern languages in Bowdoin; president of Trinity college, Hartford; provost of the university of Pennsylvania, and professor of systematic divinity in the divinity school of the Protestant Episcopal church in Philadelphia.

GOODWIN, THOMAS, 1600-1679; an English divine of the later Puritan period. In 1625 he was licensed a preacher of the university; and three years later became lecturer of Trinity church, the vicarage of which he was presented by the king in 1632. Harassed by the constant interference of his bishop, who was a zealous adherent of Laud, he resigned his preferments and left the university in 1634. He then seems to have lived for some time in London, where, in 1638, he married the daughter of an alderman; but, in the following year, he found it expedient to withdraw to Holland, and for some time was pastor of a small congregation of English merchants and refugees at Arnheim. Returning to London soon after Laud's impeachment by the long parliament, he ministered for some years to an independent congregation in the parish of St. Dunstan's-in-the-East, and rapidly rose to considerable eminence as a preacher; in 1643 he was elected a member of the Westminster assembly, and at once identified himself with the Congregational party. He frequently preached by appointment before the commons, and, in Jan., 1650, his talents and learning were rewarded by the house with the readership of Magdalen college, Oxford, a post which he held until the restoration. He rose into high favor with the protector, and ultimately became somewhat prominent among his more intimate advisers. From 1660 until his death he lived in London, and devoted himself exclusively to theological study and to the pastoral charge of a small congregation which his piety and intellectual abilities had attached to him.

GOOKIN, DANIEL, 1612-87; b. England; at the age of 9 accompanied his father, a colonist, to Virginia, but the Indians proved so troublesome that, in 1644, the family removed to Massachusetts, the more readily for the reason that their sympathies were with the Puritans. In 1656 he was made superintendent of Indian affairs in Cambridge, Mass., a position which he maintained during life. Gookin was one of the colonists who shielded Goffe and Whalley, the fugitive regicides. In military rank he rose to maj.gen., but died in such poverty that a subscription was raised for his widow. He wrote *Historical Collections of the Indians in Massachusetts down to 1674*.

GOORKHAS. See **GORKHA**, *ante*.

GOOSE FISH (angler), one of the ugliest and most voracious of the *lophiadæ*. It is about 3 ft. long and has a broad, flat, and enormous head, with a wide mouth supplied with sharp conical teeth. There are spines on the head and a fleshy fringe around the lower jaw. Five species are known. The *L. Americanus* and *L. pescatorius* are most common.—The American angler grows to 4 or 5 ft. in length, and weighs sometimes 60 or 70 lbs. This voracious glutton devours all sorts of fish that it can capture, as well as ducks and gulls. It is known as the sea-devil, fishing frog, and angler.

GOOSE LAKE, a body of water in w. Oregon and California about 30 by 10 miles. The greater portion is in Modoc co., Cal., and the outlet is Pitt river, one of the principal streams of the Sacramento.

GOPHER, a name of somewhat indefinite significance, varying in different localities, where it is used to designate different animals. It is a corruption of the French word *gauffre*, a honeycomb, which was applied by the French settlers in America to various burrowing animals which "honeycomb" the soil. The term gopher or gauffre is applied not only to burrowing mammals, but, in the southern states, to the large land tortoise (*testudo polyphemus*, see **TORTOISE**), and in Georgia, it is said, to a species of snake. The mammalian gophers, to which the name is more popularly applied, belong to the order **RODENTIA**, family *muridæ*, which embraces the rats, mice, hamsters, lemmings, voles, etc. The gophers are not confined to one genus, and other families embrace animals having all the gopher characteristics. Under the genus *geomys*, Rafinesque placed the hamsters of Georgia (*G. pinetis*) and the pouched rat of Canada (*G. bursarius*). In the genus *diplostoma*, he placed some Missouri and Louisiana animals, says sir John Richardson, "known to the Canadian voyagers by the appellation of gauffres," and remarkable for their large cheek pouches. These two genera have been adopted by few naturalists; and the American systematic writers have either overlooked *M. Rafinesque's*

species entirely, or referred them all to *G. bursarius*, and he says, "in the latter case they are undoubtedly wrong, for there are at least six or seven distinct species belonging to one or other of these genera which inhabit America," and he thinks that "both *geomys* and *diplostoma* will eventually prove to be good genera; the small sand-rats belonging to the former having cheek pouches which are filled from within the mouth, and the gaudres or camas-rats of the latter genus having their cheek pouches exterior to the mouth, and entirely unconnected with its cavity." The animal usually called the pouched gopher (*G. bursarius*) is found in Canada, Missouri, Illinois, Iowa, Texas, Mexico, and the gulf states, but, it is said, not n. of the Savannah river. It is about 9 in. long, with an almost hairless tail about 2 in. long, and weighs about 13 ounces. Its legs are short; fore feet strong, and well adapted for burrowing, having five claws, the three middle ones very large and long. The claws on the hind feet are small, but the two middle ones longer than the others, the interior one being almost rudimentary. It has twenty teeth; eight upper and eight lower molars, and four incisors which are very strong, especially the lower pair, which are much longer than the upper. The ears are very small. The animal is reddish-brown on the back and sides, ashy beneath, and has white feet. It burrows in sandy soils, throwing up the earth in little mounds. It subsists on grass, roots, nuts, buds, and farm vegetables. Its most remarkable characteristic is the possession of pouches which cover the side of the head, and are capable of being so distended as to enable the animal to carry a considerable load of provisions. The true southern gopher, or Georgia hamster (*G. pinetis*), is a larger animal, found in Alabama, Georgia, and Florida. Prof. Baird describes five other species. On the Pacific coast there are several kinds of gophers. Sir John Richardson's *G. Douglasii* was $6\frac{1}{2}$ in. long, with a tail nearly three inches, cheek pouches large, resembling the thumb of a glove, hanging down by the side of the head. When in the act of emptying its pouches the animal sits on its hams, like a marmot, or squirrel, and squeezes the sacks against his breast with his chin and fore paws. These little animals are numerous about fort Vancouver, where they burrow in the sides of sand-hills, feeding on acorns and other nuts, grass, buds, potatoes, and other root crops of the farmers. There are other species in America which are called, in the localities where they abound, gophers, or gaudres. All those not inhabiting warm climates hibernate. There are many similar animals in various parts of the world, having the same habits, such as the coast rat, or cape rat, or brant, of the Cape of Good Hope, which undermines the ground to an extent which makes it dangerous to ride over it on horseback, and difficult to proceed on foot. The jumping mice, or jerboas, of which the gerbo, or Egyptian jerboa may be considered as the type, now placed in another family (*dipodidae*), would naturally, in this country, come under the name of gopher, and the same may be said of the marmots, now placed in still another family with the squirrels (*Sciuridae*), for the Alpine marmot is about as gopher-like in its habits as any of the animals so named. See RODENTIA.

GORAKHPUR, a district of the north-western provinces, India, between $26^{\circ} 50'$ and $27^{\circ} 28'$ n. lat., and between $83^{\circ} 7'$ and $84^{\circ} 29'$ e. long., bounded on the n. by the territory of Nepaul, on the e. by Champáran and Sárán, on the s. by the Gogra river, and on the w. by Basti and Fyzabad, with an area of 4,578 sq. miles. The district lies immediately s. of the lower Himalayan slopes, but forms itself a portion of the great alluvial plain. Only a few sand hills break the monotony of its level surface, which is, however, intersected by numerous rivers studded with lakes and marshes. In the n. and center dense forests abound, and the whole country presents a verdant appearance. The principal rivers are the Rapti, the Gogra, the great and little Gandak, the Kuána, the Rolim, the Ami, and the Gunghí. The tiger is found in the n., and many other wild animals abound throughout the district. The lakes are well stocked with fish. The pop., which in 1853 numbered 1,816,390, had risen to 2,019,361 in 1872. Of these, 1,819,445 or 90.1 per cent are Hindus, 199,372 Mussulmans, and 533 Christians. The district contains a total cultivated area of 2,621 sq. m., with 897 sq. m. available for cultivation, most of which is now under forest. The chief productions are cotton, rice, *bājra*, *joáh*, *moth*, and other food-stuffs.

Gautama Buddha, the founder of the religion bearing his name, died within the district of Gorakhpur. It thus became the head-quarters of the new creed, and was one of the first tracts to receive it. The country from the beginning of the 6th c. was the scene of a continuous struggle between the Bhars and their Aryan antagonists, the Rahrors. About 900, the Domhatárs or military Bráhmíns appeared, and expelled the Rahrors from the town of Gorakhpur, but they were also soon driven back by other invaders. During the 15th and 16th centuries, after the district had been desolated by incessant war the descendants of the various conquerors held parts of the territory, and each seems to have lived quite isolated, as no bridges or roads attest any intercourse between them. Towards the end of the 16th c., Mussulmans occupied Gorakhpur town, but they interfered very little with the district, and allowed it to be controlled by the native rájás. In the middle of the 18th c. a formidable foe, the Banjás from the w., kept the district in a state of terror, and so weakened the power of the rájás that they could not resist the fiscal exactions of the Oudh officials, who plundered and ravaged the country to a great extent. The district formed part of the territory ceded by Oudh to the British under the treaty of 1801. During the mutiny it was lost for a short time, but

under the friendly Gürkáhs the rebels were driven out, and the whole district once more passed under British rule.

GORDON, a co. in n.w. Georgia, on the Oostenaula river, traversed by the Selma, Rome, and Dalton, and the Western and Atlantic railroads; 420 sq.m.; pop. '80, 11,170—1822 colored. The surface is rough, and forests cover a large portion. Soil fertile, producing corn, wheat, pork, and hay. Co. seat, Calhoun.

GORDON, CHARLES GEORGE, b. England, 1833; was lieut. of engineers in 1852; served in the Crimean war, and was wounded at Sebastopol. After peace was concluded, he was employed in surveying and settling the Turkish and Russian frontier in Asia. He was engaged in the expedition against Pekin, and after all the objections raised by the Chinese government had been satisfied, he remained in the Chinese service. At the close of the year 1861 he made a journey from Pekin to the Chotow and Kalgan passes on the great wall, passing Tiayuen, a city never before visited by Europeans. In 1863 he was appointed commander of the "Ever Victorious Army," and was mainly instrumental in suppressing the formidable Tai-Ping rebellion in that and the succeeding year. He found the richest and most fertile districts of China in the hands of the most savage brigands. The silk districts more particularly were the scenes of their cruelty and riot, and the great historical cities of Hangchow and Soochow were threatened with the fate of Nanking, and were fast being reduced to ruins. Gordon relieved the great cities, dispersed the remnants of the rebel forces, and confined them to a few tracts of devastated country and their stronghold at Nanking. A detailed account of his exploits is given in Andrew Wilson's *Ever Victorious Army*. He was promoted to the rank of capt. in 1859, became maj. in 1862, and lieut.col. Feb. 16, 1864. He was nominated a companion of the Bath, Dec. 9, 1864. He was British vice-consul of the delta of the Danube, Turkey, from 1871 till 1873, when he conducted an expedition into Africa under the auspices of the khedive of Egypt, by whom he was appointed governor of the provinces of the equatorial lakes. Subsequently he was created a pasha, and in Feb., 1877, the khedive appointed him governor of the whole of Soudan.

GORDON, JOHN B., b. Ga., 1832; graduated at the state university and followed the profession of law. Early in the war of the rebellion he joined the southern army, and rose through the various grades to that of lieut.gen. He commanded one wing of Lee's army at Appomatox. He was wounded several times during the war. In 1868 he was the democratic candidate for the governorship of Georgia, but was not elected. In 1873 he was elected to the U. S. senate.

GORDON, WILLIAM, 1730-1807; a clergyman of England who came to Massachusetts in 1770 and was minister of the third church in Roxbury. He was for a time chaplain to the provincial congress. About 1786 he returned to England, where he published *History of Rise, Progress, and Establishment of the Independence of the United States of America*.

GORE, CHRISTOPHER, 1758-1827; b. Boston; a graduate of Harvard, and a lawyer. He was the first U. S. district attorney for Massachusetts and contributed largely, as one of the commissioners, to the settlement of the claims of this country upon Great Britain. He was governor of his state in 1809, and U. S. senator 1814-17. He bequeathed the greater part of his property to Harvard college.

GORGES, SIR FERDINANDO, lord proprietary of the province of Maine; b. in Somersetshire, England, at a date unknown, d. at an advanced age in 1647. He was engaged in the conspiracy led by the earl of Essex, against whom he was a witness in the trial of 1601. After serving for a time in the English navy, he was in 1604 appointed governor of Plymouth. Becoming deeply interested in the settlement of the new world, he resolved to become a proprietor of some part of its territory. Popham, the lord chief-justice of England, was persuaded to join him. In 1606 the king incorporated the London and Plymouth colonies, dividing between them the American territory, extending 50 m. inland from the 34th to the 45th parallel n. latitude. The Plymouth colony had the northern half, under the name of Northern Virginia. On May 31, 1607, three ships with 100 emigrants sailed from Plymouth, England. They landed at the mouth of the Kennebec, Maine, where they began a settlement, which, however, they were soon obliged to abandon. Capt. John Smith, as agent for Gorges, made several unsuccessful attempts to establish other settlements; but in 1616 Gorges sent out a small party which encamped for the winter on the river Saco. In 1620 Gorges and his associates obtained a new charter for the "Governing of New England in America," which gave them title to the territory extending westward from the Atlantic to the Pacific, between the 40th and 48th parallels n. latitude. Gorges and John Mason took grants of the district called Laconia, lying between the Merrimack and the Kennebec, and extending from the Atlantic to the "river of Canada," and under the auspices of the former, several settlements were made. In 1623 capt. Robert Gorges, son of Ferdinando, was appointed by vote of the council for New England, "general governor of the country." Twelve years later, however, the council resigned the charter to the king, the elder Gorges expecting to be thereupon appointed governor general. Disappointed in this, he induced the king to grant him a charter constituting him lord proprietary of the province of Maine, and providing that his office should remain hereditary

in his family. His son Thomas was sent out as deputy governor. The principal settlements were Agamenticus and Saco, the former being the place now called York, and which was chartered as a city in 1642 under the name of Gorgeana. In 1643 the four New England colonies formed an alliance for mutual defense, excluding therefrom the Gorges settlements, because, as Winthrop says, "They ran a different course from us both in their ministry and civil administration," and furthermore because the "lord proprietary of the province of Maine" was then fighting in England for the king against the cause of the Puritans. After the death of Gorges the settlements established by him formed themselves into a body politic and submitted to the jurisdiction of Massachusetts. His grandson, Ferdinando, born in 1629, received from Massachusetts the sum of £1,250 for relinquishing his rights as an heir to the province of Maine. This grandson was the author of *America Painted to the Life*, published in London in 1659.

GORGONA, a small island in the Pacific, about 30 m. from the w. coast of South America, in 2° 51' n. lat.: 78° 4' w. long.; 6 by 2 miles. Portions of the surface rise 2,000 ft. above the tide. It was once the haunt of pirates, and it is said that Pizarro landed on the island just before he made his attack on Peru.

GORHAM, a village in Coos co., N. H., and in Gorham township, on the Grand Trunk railroad, about 10 m. n.e. of Mount Washington. The township had 1,167 pop. in 1870. The village is delightfully situated and is much frequented by summer visitors.

GORHAM CONTROVERSY. See RITUALISM, *ante*.

GORITZ. See GÖRZ, *ante*.

GOROZA, GORO SABURO. A Japanese family of metal workers in Kioto, who for nine generations have followed the craft of bronze smiths, producing the finest quality of plain, tinted, *repoussé* and gold and silver inlaid, ornamental bronzes, and fine works of art. Nearly all Goroza bronze bears the stamp of the family name, Goro, with the contraction of the personal name of the living head of the house. Many hundred of pieces of Goroza bronze are now in the United States.

GORTON, SAMUEL, 1600-77; an English clothier who came to Boston in 1636, became involved in disputes on religious topics, went to Plymouth and began to preach; but he was looked upon as a heretic, and was banished in 1637. In Rhode Island (at Aquidneck), he was publicly whipped for scandalizing the magistrates. He found protection at Providence, with Roger Williams. Thence he went to the other side of Narragansett bay and bought the lands owned by the Indian chief Miantonomo. His claim was disputed by other Indian chiefs, and the dispute being referred to the Boston authorities, soldiers were sent, who took Gorton and ten of his people prisoners. They were tried at Boston on charge of being "damnable heretics," and sentenced to hard labor in chains. Five months afterwards they were released and driven out of the colony. Gorton then returned to England and obtained from the earl of Warrick an order for the land he had bought from the sachem. He named the place Warrick, and henceforward lived in peaceful possession. He preached occasionally, and filled a number of local civil offices. A sect, of which he was the founder, though few in number, existed for about a hundred years. He was also an author, and published *Simplicitie's Defense against Seven-Headed Policy; An Incorruptible Key composed of the CX. Psalm; An Antidote against the Common Plague of the World*, and other works.

GORTYNA, an ancient city of importance on the southern side of the island of Crete. It stood on the banks of the small river Lethæus (Mitropolipotamo), at a short distance from the sea, with which it communicated by means of its two harbors, Metalum and Lebena. It possessed temples of Apollo, Pythius, Artemis, and Zeus. Near the town was the famous fountain of Sauros, inclosed by fruit-bearing poplars; and not far from this was another spring, overhung with an evergreen plane-tree which in popular belief marked the scene of the amours of Jupiter and Europa. Gortyna was the second city in Crete, next to Gnosus in importance. The two cities combined to subdue the rest of the island; but having gained their object, they quarreled with each other, and the history of both towns is from this time little more than a record of their feuds. Neither plays a conspicuous part in the history of Greece. Under the Romans Gortyna became the metropolis of the island. Some ruins may still be traced at the modern village of Hagii Deka.

GÖSCHEN, GEORGE JOACHIM, b. England 1831; educated at Rugby and Oxford, but declined to graduate having scruples about taking certain oaths. Going into mercantile business he paid special attention to financial questions, but left his firm in order to take office in the Russell-Gladstone ministry. He was returned in the liberal interest for the city of London in 1863, on the death of Mr. W. Wood, and he took an active share in throwing open the universities to dissenters, and in bringing about the abolition of religious tests. He was re-elected for the city of London, at the head of the poll, in July, 1865, and became vice-president of the board of trade, when he was sworn of the Privy Council, and chancellor of the duchy of Lancaster and a cabinet minister, 1866, retiring with the Russell ministry in June of that year. Upon Gladstone's accession to power, Dec., 1868, he was appointed president of the poor-law board, which office he held till March, 1871, when he succeeded Mr. Childers as the first lord of admiralty. He went out of office with his party, Feb., 1874. At the general

election in that year he was the only liberal candidate returned for the city. In 1876 Göschel and M. Joubert were chosen as delegates of the British and French holders of the Egyptian bonds to concert measures for the conversion of the debts. Göschel attended the international monetary conference held at Paris, in Aug., 1878. He has written largely on financial questions, and his treatise on *The Theory of the Foreign Exchanges* has been translated into French. He has published his *Speech on the Oxford University Tests Abolition Bill*, and *Speech on Bankruptcy Legislation* and other commercial subjects.

GOSHEN, the seat of justice of Elkhart co., Ind., on the Lake Shore and Michigan and other railroads, and Elkhart river, 111 m. s.e. of Chicago; pop. 3,133. The village has a court-house, churches, banks, a high school, and manufactories of flour, iron, wool, furniture, and farming implements, all run by the water power of the river.

GOSHEN, the seat of justice of Orange co., N. Y., on the Erie and the Wallkill Valley railroads; pop. 2,205 exclusive of township. The chief occupations are the manufacture of bricks, tiles, cheese and butter—the latter article being famous for excellence. The village contains a court-house, six or seven churches and a number of classical schools.

GOSLICKI, WAWRZYNIEC, 1533-1607; a learned Pole, better known under his Latinized name of LAURENTIUS GRIMALIUS GOSLICIUS. Having studied at Cracow and Padua, he entered the church, and was successively appointed bishop of Kaminietz and of Posen. Goslicki, although an ecclesiastic, was an active man of business, was highly esteemed by his contemporaries, and was frequently engaged in political affairs. It was chiefly through his influence, and through the letter he addressed to the pope, that the Jesuits were prevented from establishing their schools at Cracow. He was also a strenuous advocate of religious toleration in Poland.

GOSNOLD, BARTHOLOMEW, d. Va., 1607; one of the earliest English voyagers, concerned in Raleigh's Virginia venture, and afterwards chosen by the earl of Southampton to found a colony in New England. He set out with a single small vessel and only 20 colonists in the spring of 1602, passing cape Cod (to which he gave its name), and landing at the mouth of Buzzard's bay, planted his colony on the island of Cuttyhunk. Many circumstances combined to render the enterprise unsuccessful, and three months later he conducted his people back to England, taking a cargo of furs, cedar, and sassafras root—the latter a valuable medicine. Gosnold then undertook a similar venture in Virginia, obtained a charter for a colony from James I. April 10, 1606, sailed with 3 vessels and 105 settlers, and laid the foundation of Jamestown, the first English settlement in the original United States. Gosnold fell a victim to the unhealthy climate, as did also 50 of the colonists.

GOSPELERS, a name applied to different classes of persons with three different meanings. I. As a term of reproach by Romanists to those who strove to circulate the Scriptures in the language of the people. It was first applied in England to Wickliffe and his followers when he had translated the New Testament into English. II. At the time of the reformation to a class of antinomians concerning whom bishop Burnet says: "I do not find anything objected to them as to their belief save only that the doctrine of predestination having been generally taught by the reformers, many of this sect began to make strange inferences from it, reckoning that since everything is decreed, and the decrees of God could not be frustrated, therefore men were to leave themselves to be carried by these decrees. This drew some into great impiety of life, and others into desperation. The Germans soon saw the ill effects of this doctrine. Luther changed his mind about it, and Melancthon wrote against it. Calvin and Bucer were for maintaining the doctrine of these decrees; only they warned the people not to think much concerning them, since they were secrets which men could not penetrate into. Hooper, and many other good writers, did often exhort the people against entering into these curiosities; and a caveat to the same purpose was afterwards put into the article of the church about predestination." III. In the ritual of the church of England the minister who read the gospel for the day, standing at the n. side of the altar, was formerly called the *gospeler*, in distinction from the reader of the epistle—standing at the opposite side—who was called the *epistoler*.

GOSSE, PHILIP HENRY, b. England, 1810; early exhibited intense fondness for natural history, but embarked in mercantile business in Newfoundland. He visited Lower Canada, studying zoology, and entomology, for three years. He traveled through the United States, and resided in Alabama for a year, making a collection of drawings of insects, especially the fine lepidoptera of that region. In 1839, returning to England, he published *The Canadian Naturalist*, 1840. In 1844 he visited Jamaica, and spent eighteen months in the collection and study of the zoology of that island; publishing the result in *The Birds of Jamaica*, followed by an atlas of *Illustrations*, and *A Naturalist's Sojourn in Jamaica*. The composition of numerous works on zoology and other subjects chiefly for the society for promoting Christian knowledge, occupied several years, during which time he also turned his attention to the microscope, by the aid of which he conducted his latest researches. His special delight was the study of British

rotifera, and he made a valuable collection of facts concerning them, with a view to publication. In *A Naturalist's Rambles on the Devonshire Coast* he describes his investigations. In 1854 he published *The Aquarium*; in 1855 *A Manual of Marine Zoology*; in 1856 *Tenby, a Seaside Holiday*; and in 1857 *Omphalos; an attempt to write the Geological Knot*. In the autumn of the same year he removed from London to Torquay, and published in 1860 the most important of his works, *Actinologia Britannica; a History of the British Sea Anemones and Corals*. He has written *Evenings at the Microscope*; *Letters from Alabama*; *The Romance of Natural History*; *A Year at the Shore, and Land, and Sea*. In 1856 he was elected a fellow of the royal society.

GOTA, a river in s. Sweden, connecting Wener lake with the Cattegat. Canals and locks make navigation from the Baltic to lakes Wener and Wetter easy and profitable. This river is noted for the romantic scenery along its banks.

GOTAMA, a native of India, the date of whose birth and death are unknown, but supposed to have lived in very ancient times. He is the author, according to some critics, of the *Nyaya Sutra*; and sir William Jones held that from his writings on logic Aristotle took the syllogism. The drift of critical opinion, however, is that Gotama was indebted to Greece.

GOTHAM, a parish in England, in Nottinghamshire, the name of which is used as a synonym for simple or foolish people. This usage arose from the tradition that when king John proposed making a progress through the town with the intention of purchasing a castle the people being averse to the expense of maintaining royalty, determined to disenchant him by engaging in the most idiotic pursuits. The king turned away, and the wise men of the town remarked "that more fools pass through Gotham than remain in it." Irving, in his *Kniekerbocker History*, applies the epithet to New York in the time of the Dutch.

GOTHENBORG, a province of Sweden forming a narrow territory along the Cattegat and the Skager Rack; 1,890 sq. m.; pop. '78, 252,952. It is rough and mostly sterile, with a severe climate. The chief town bears the same name.

GOTHIC LANGUAGE AND LITERATURE. The words Goth and Gothic have a somewhat vague signification, being popularly associated with much legendary history and many rash etimological speculations. In early times they were used contemptuously to designate anything deemed mediæval or romantic as opposed to classical. Such a use of the Gothic name must be carefully distinguished from the history of the true national Goths who played so great a part in Europe from the 3d to the 8th c. of the Christian era, and who may, on many grounds, claim a foremost place among the Teutonic nations which had so prominent a share in the overthrow of the Roman empire. They were among the earliest of those nations to establish themselves within the empire, and no other Teutonic people has left behind it such early remains of a written literature. The wonderful thing is that a people who played so great a part for several ages should have wholly passed away. Not for many ages have they existed anywhere as a distinct nation, nor have they given an abiding name to any part of Europe. Their first certain historical appearance was in the lands north of the lower Danube in the 3d c. of our era; for any earlier account of them we must resort to traditions and myths, as confusing as they are abundant. Of the character of the Gothic language our earliest direct evidence is in fragments of a translation of the Bible and some other religious writings, which, although preserved in manuscripts not dating further back than the 5th c., and clearly written in Italy during the rule of the east Goths, are commonly assumed to have originated among the west Goths in Mæsia, and to be older by a century than the manuscripts themselves. The Finnish tribes, originally dwelling in the interior of Russia, borrowed numerous words from the Gothic at a much earlier day, and from a careful examination of these some conclusions have been drawn regarding a more archaic state of the language. Some of these words, it may be safely assumed, still retain forms of the Gothic language from as early a period as the 1st or 2d c. B.C.—Ulfila, a Gothic bishop, who lived in the 4th c. of our era, invented an alphabet of twenty-four letters based on the Greek, and translated into Mæso-Gothic the whole Bible except the Book of Kings. Only fragments of this version are now in existence, though it was in constant use among the Goths while they retained their nationality. These fragments embrace the greater part of the gospels, considerable portions of the epistles, and a few remnants of the Old Testament. There are besides a few fragments of a commentary on John's gospel, and part of a Gothic calendar, giving the name of the Gothic people as *Gut-thiuda*, from which it may be inferred that the Goths called themselves *Gutts*. The language as known to us, although very archaic in many of its forms and sounds, is still far removed from the original features of the common language as spoken before any separation of the Teutonic tribes had taken place. Most nearly related to it seem to have been the Scandinavian languages, which are now generally assumed to have formed, together with Gothic, the so-called eastern branch of the Teutonic family, while English, Frisian, and low and high German belong to a western division. The latter is chiefly marked by the introduction of a considerable number of forms and sounds of a less archaic stamp, while the eastern idioms are found to have adhered more closely to the original forms.

GOTHOFRED, or GODEFROY, the name of a noble French family, of which many members attained distinction as jurists or historians. The first, whose name is associated with the active study of jurisprudence, at the close of the 16th c., was DENIS GODEFROY, 1549-1621. He studied law at the universities of Louvain, Cologne, and Heidelberg. Having embraced the reformed religion, he found Geneva a safer abode than Paris, and became professor of law there. Some years afterwards he obtained a public appointment in one of the districts in the Jura, but was driven from his home by the troops of the duke of Savoy and retired to Basel. Thence he was induced by the offer of a chair of Roman law to go to Strasburg, but soon changed his appointment for one at Altorf, which then possessed a university celebrated for its late professor of law, Donneau. In 1600 the elector palatine appointed him professor of Roman law in Heidelberg, where he spent the greater portion of the remainder of his life, and was placed at the head of the faculty of law. The most flattering offers from several universities failed to induce him to leave his adopted country, but the invasion of the palatinate by Tilly's troops forced him to take refuge again at Strasburg, where he died. His most important work is his edition of the *Corpus Juris*. The text given by him was very generally adopted and used in quotation. More than twenty editions of the work were published in various towns of France, Germany, and Holland. Godefroy's other writings are very numerous; but they are for the most part either editions of classical authors or compilations which display great industry and learning, but are of little use to the modern student. THEODORE GODEFROY, 1580-1649, the eldest son of Denis, forsook the religion which his father had adopted, and obtained the office of historiographer of France, as well as several important diplomatic posts. His historical works are very numerous. The character of his labors will be judged from the title of his most elaborate production, *Le Cereimonial de France*. Many of his smaller works are devoted to questions of genealogy. JACQUES GODEFROY, 1587-1652, the younger brother of Theodore, has a real claim to the remembrance of students of the history of Roman law in his edition of the *Theodosian Code*, at which he labored for thirty years. It was this code, and not the *Corpus Juris* prepared under the direction of Justinian, which formed the principal though not the only source from which the lawyers of the various countries which had formed the western empire drew their knowledge of Roman law, at all events until the revival of the study of law in the 11th c. at Bologna. Hence, Godefroy's edition was of real value. Jacques Godefroy also completed the difficult and useful task of collecting and arranging those fragments of the *Twelve Tables* which can be discovered, and so an important step was taken towards representing the Roman law in its first definite form. His other works are very numerous, and are principally devoted to the discussions of various points of Roman law. He served the republic of Geneva both as its principal magistrate and in undertaking important missions to the court of France. [Extracted from *Encyc. Britannica*, 9th edition.]

GOTTSCHALK, or FULGENTIUS, a prominent figure in one of the most important theological controversies of the 9th c., was the son of Berno, a Saxon count, and, having been devoted from infancy by his parents to the monastic life, was trained at the monastery of Fulda, during the abbacy of Hrabanus Maurus, and while Walafridus Strabus was a member of the fraternity. At the approach of manhood he made strenuous efforts to be released from his vows; and he actually succeeded in obtaining from a synod held at Mainz in 829 the necessary dispensation; but through the hostile influence of his abbot this was afterwards cancelled by Louis the Pious, though as a slight mitigation of the harshness of this treatment he was permitted to remove to the monastery of Orbais, in the diocese of Soissons. Here he devoted himself to ardent study of the writings of Augustine, with the result that he became an enthusiastic believer in the doctrine of absolute predestination, in one point going even beyond his master, Gottschalk believing in a predestination to condemnation as well as a predestination to salvation, while Augustine had contented himself with a doctrine of preterition as complementary to his doctrine of election. While returning from a pilgrimage to Rome in the year 847, Gottschalk, happening to pass a night at a hospice in Friuli, came into contact with Notting, the newly-elected bishop of Verona, and expounded to him his peculiar views. The bishop, apparently without saying much at the time, carried word to Hrabanus Maurus, who, meanwhile, had become archbishop of Mainz; the latter lost no time in issuing two letters, one to his informant and another to count Eberhard of Friuli, in both of which he denounced the opinions of Gottschalk with some recklessness and great violence. On the one hand he accused his adversary of neglecting the distinction between foreknowledge and foreordination; on the other hand, he himself refused to recognize any difference between predestination to punishment and predestination to sin. At a synod held in Mainz in presence of the emperor, in 848, Gottschalk presented himself with a written explanation and defense of his views; he was, however, very summarily found guilty of heresy, and handed over to his ecclesiastical superior, Hincmar of Rheims, to be dealt with as his crime might deserve. Having again assumed the defensive in an assembly at Chiersy in 849, he was once more condemned—on this occasion not only as a heretic, but also as a despiser of authority, and as a disturber of the church's peace—and sentenced to be whipped severely and rigorously imprisoned.

The place selected for his captivity was the monastery of Hautvilliers, in the diocese of Rheims, and here he languished throughout the remainder of his life, a period of 20 years, notwithstanding the efforts of influential friends and his own pitiful appeals. Prudentius of Troyes, Wenilo of Sens, and Florus of Lyons successively expressed opinions more or less in favor of his views; nor did Hincmar derive much real aid from the dialectical skill of Erigena, whom he had called in as an authority on the other side. Various synods met, reached widely discrepant opinions on the burning question, and ultimately postponed its settlement to a future council in less troubled times. The summons of pope Nicholas I., in 863, calling Hincmar to account for his harsh conduct, unfortunately never took effect; and the result was that, after many renewed attempts at conviction and persuasion on the part of Gottschalk—he even proposed to settle the question by ordeal of fire—he was suffered to die unheeded in 868, and by orders of his inhuman adversary was buried in unconsecrated ground. It may be added that Gottschalk had attempted to establish a counter charge of heresy against Hincmar, on account of the latter's substitution of *Sancta Dictus* for *Trina Dictus* in a current hymn. This was thought to savor of Sabellianism; but the orthodox bishop succeeded at once in purging himself from such an imputation of heretical depravity. [Extracted from *Encyc. Britannica*, 9th Edit.]

GOTTSCHALK, LOUIS MOREAU, 1829-69; b. New Orleans, d. Rio de Janeiro. He showed great musical talent at an early age, and was sent to Paris when 12 years old to receive instructions from Hallé and Camille Stamaty on the piano, and from Maleden in harmony. He made his first appearance as a public performer in Europe, but in 1853 returned to America, playing in New York and other cities with much success. His execution, especially when playing his own compositions, was greatly admired, and in some of his pieces illustrating tropical life he has never been excelled. He composed over 50 pieces for the piano, of which the best known are *Lebanonier*; *La savane*; *Répondati*; *La marche de nuit*; *O ma charmanté*; *Le manœuvrier*; *Réponds moi*; *Ojos criollos*, and a number of Cuban dances. His touch combined extreme delicacy with force and dash. His style of playing had a dreamy and sensuous charm that drew large audiences to his concerts, which were given in many cities of Europe, the United States, Mexico, South America, and Australia.

GOUDIMEL, CLAUDE, 1510-72; one of the founders of modern music, claimed both by France and Belgium. In 1540 he was in Rome at the head of a music school, and among many other celebrated musicians, Palestrina, the greatest master of the early Italian school, and one of the greatest masters of all schools, was his pupil. About the middle of the c. he seems to have left Rome for Paris, where, in conjunction with Jean Duchemin, he published, in 1555, a setting of Horace's *Odes*, entitled, *Horatii Flacci ode omnes quotquot carminum generibus differunt ad rhythmos musicos reductæ*. Infinitely more important is another collection of vocal pieces, a setting of the celebrated French version of the Psalms by Marot and Beza, published in 1565. It is written in four parts, the melody being assigned to the tenor. Some of the tunes are probably of popular origin, and they are still used by the French Protestant church. Others were adopted by the German Lutherans, a German imitation of the French versions of the psalms in the same meters having been published at an early date. There is little doubt that, at the time of the last-named composition, Goudimel had embraced the new faith, although the French version of the psalms was at first used by Catholics as well as Protestants. Seven years later he fell a victim to religious fanaticism during the St. Bartholomew massacres at Lyons.

GOUGH, HUGH, Viscount, 1779-1869; b. Ireland. He joined the British army, serving at the cape of Good Hope and in the peninsular war, being several times wounded. In 1830 he was made maj.gen.; was prominent in the opium war in China in 1841; afterwards served in several Indian wars against the Mahrattas and the Sikhs. Later in life he was a member of the privy council, and in 1862 was promoted to be field-marshal.

GOUJON, JEAN, 1520-72; a French sculptor, employed by Pierre Lescot, the celebrated architect of the Louvre, on the restoration of St. Germain l'Auxerrois; the building accounts specify as his work, not only the carvings of the pulpit (Louvre) but also a "Notre Dame de Piété," now lost. At the Louvre, Goujon, under the direction of Lescot, executed the carvings of the south-west angle of the court, the reliefs of the "Escalier Henry II.," and the "Tribune des Caryatides." About a year before the execution of the Caryatides, for which Goujon received 737 livres, he produced, according to unbroken tradition, the reliefs of the "Fontaine des Innocents" (Louvre, and *in situ*); after which he is supposed to have been occupied in work destined for the decoration of the chateau of Anet, then builder for Diana of Poitiers. In 1555 his name appears again in the Louvre accounts, and continues to do so every succeeding year up to 1561, when all trace of him is lost. In the course of this year an attempt was made to turn out of the royal employment all those who were suspected of Huguenot tendencies. Goujon has always been claimed as a reformer; it is consequently possible that he was one of the victims of this attack. We should therefore probably ascribe the work attributed to him in the hotel Carnavalet together with much else executed in various parts of Paris—but now dispersed or destroyed—to a period intervening between

the date of his dismissal from the Louvre and his death (of which there is no evidence), which is said to have taken place during the St. Bartholomew massacre in 1572.

GOULBURN, a city in New South Wales, 120 m. s.w. of Sydney, on the Great Southern railroad, near the junction of Wollondilly river and the Mulwaree ponds; pop. 3,500. The Roman Catholics and the Church of England have bishops here. Minerals are found near by, but the main business of the region is agriculture.

GOULBURN, EDWARD MEYRICK, D.D., b. England, 1818; educated at Oxford, where he was for some years a tutor, and at the same time held the incumbency of Holywell, Oxford. In 1850, he became master of Rugby school, and in 1858 prebendary of St. Paul's, and subsequently dean of Norwich. Among his works are: *The Doctrine of the Resurrection of the Body*; *Principles of the Cathedral System Vindicated*; *Thoughts on Personal Religion*; *Pursuit of Holiness*; and *The Holy Catholic Church, its Divine Ideal, Ministry, and Institution*.

GOULD, AUGUSTUS ADDISON, 1805-66; b. N. H.; an American naturalist. His father's family name was Duren, but it was changed to Gould. He graduated at Harvard in 1825, and taking his medical degree five years later, entered into practice in Boston. During his college term he gave much attention to natural history, and after entering upon his professional career, was an instructor in botany and zoology in Harvard college for two years. In 1856 he was appointed visiting physician to the Massachusetts general hospital. As a naturalist he was eminent, especially so in the department of conchology. He was a frequent contributor to scientific periodicals, and author of works bearing the following titles: *Genera of Shells*, translated from Lamarck; *System of Natural History*; *The Invertebrate Animals of Massachusetts*; *Principles of Zoology*; *Mollusca and Shells of the United States*; *Exploring Expedition under Captain Wilkes*; completion of Dr. A. Binney's *Land Mollusks of the United States*; *The Mollusca of the North Pacific Expedition under Captains Ringold and Rogers*, and *Otia Conchologica*.

GOULD, BENJAMIN APTHORP, 1787-1859; b. Mass. He graduated at Harvard in 1814, and was principal of the public Latin school in Boston from that time until 1828, when the failure of his health compelled him to resign. He prepared for that school several text-books, especially a revised and improved Latin grammar, which had an extensive circulation. In the later period of his life, he filled several important public positions.

GOULD, BENJAMIN APTHORP, b. Boston, 1824; graduated at Harvard, 1844. After his graduation he went to Göttingen, where he pursued his mathematical and astronomical studies, and took his degree in 1848. He was for a time assistant in the observatory at Altona, and visited besides many of the observatories of Europe. In 1849 he established at Cambridge the *Astronomical Journal*, maintaining it until 1861, when it was suspended on account of the war. In 1851 he entered the coast survey, taking charge of the longitude determinations, to which the electric telegraph had just been applied by Bache and Walker. He made great improvements in the telegraphic methods, by means of which very important results were secured. In 1866, when the transatlantic cable had been completed, he established an observatory at Valentia in Ireland, and made the first determinations of transatlantic longitude by telegraph cable. In 1856 he was appointed director of the Dudley observatory at Albany, remaining at the post until 1859, when he retired on account of serious differences with the trustees. His action in the matters which led to the misunderstanding was afterwards justified by a committee of scientific men. His labors in the observatory were of great value, and performed without remuneration. In 1863 he took charge of the statistics of the sanitary commission. His researches while thus engaged were alike curious and important. In 1870 he went to South America, and established a national observatory for the Argentine Republic at Cordova, where he still remains (1880), and where his labors have been of the highest value to the cause of science. His principal publications are: *Report on the Discovery of the Planet Neptune*; *Investigation of the Orbit of Comet V.*; *Discussions of Observations made by the U. S. Astronomical Expedition to Chili, to determine the Solar Parallax*; *Discussion on the Statistics of the U. S. Sanitary Commission*. He has also published charts of the stars discovered from the observatory at Cordova.

GOULD, HANNAH FLAGG, 1789-1865; b. Mass. She wrote extensively for magazines and newspapers, and some of her verses were copied and admired in England. A volume of her poems appeared in 1832, a second in 1836, and a third in 1851. Her other works are: *Gathered Leaves* (prose sketches); *The Diosma*, composed partly of original and partly of selected poems; *The Youth's Coronet*; *The Mother's Dream*, and other Poems; and *Hymns and Poems for Children*.

GOULD, JAMES, LL.D., 1770-1838; b. Conn. He graduated at Yale, served as justice of the supreme court of Connecticut, and for forty years was associated with Hon. Tapping Reeve as a professor in the Litchfield law school. He published, in 1832, *Principles of Pleading in Civil Actions*.

GOULD (*ante*), a term more narrowly applied in America than in England. In the latter country it includes all members of the order *eucurbitacea*, here only those of the genus *laginaria*. It is a well-known climbing plant bearing a large bottle-shaped fruit,

the shell of which is almost as hard as that of the cocoanut, and is largely used in the southern states for water dippers. It is a native of Africa. One known as the orange gourd is cultivated in Texas for ornament.

GOURGUES, DOMINIQUE DE, 1530-93; b. France; entered the army, served in Spain, was taken prisoner in Italy and condemned to the galleys, was taken by the Turks and rescued by the knights of Malta. He traveled in Asia, Africa, and South America. In 1567, he left France with three ships and a small force of men to punish the Spaniards for killing the French explorers in Florida. This, with the aid of an Indian chief, he effected, hanging the Spaniards on the trees from which they had suspended the French. For several years afterwards he lived in obscurity, but was at last restored to favor in France, and the king of Portugal put him at the head of a fleet to operate against Philip II. A complete history of this adventurer is given in Parkman's *Pioneers of France in the New World*.

GOURKO, JOSEPH VLADIMIROVITCH, a Russian gen., b. Nov. 15, 1828. Entering the army as cornet of hussars of the imperial guard, he was created capt. in 1852, and in this capacity served in the Crimean war. In 1857, he was assigned to the command of the emperor's squadron in his old regiment of the guards, and in 1860 made an adjutant of the emperor. His next promotion was to a colonelcy, in which capacity he served in the campaign in Poland in 1863. In 1867 he was created a maj.gen. in the suite of the emperor, and assigned to the command of a brigade in the second cavalry division of the guards. In 1876 he was created lieut.gen. and put in command of the same division. At the head of an "advance corps," and leaving the main army behind, he made a rapid march to the Danube, thence to Tirnova, and finally beyond the Balkans, creating great consternation in the Turkish empire. He was afterwards forced to retreat to the Shipka pass, and was then ordered to return to St. Petersburg, where he was created adj.gen. and put in command of his own division.

GOUSSET, THOMAS MARIE JOSEPH, 1792-1866; b. France, of a peasant family. At the age of 25 he was made a priest, and soon became professor of moral theology in Besançon, holding the place 17 years. In 1825 he published a work, much in advance of most thinkers, on the relations of the church to usury. In 1836 he was appointed archbishop of Rheims, and in 1850 became a senator of France and a cardinal. His chief works are on dogmatic and moral theology.

GOVE, a co. in w. Kansas, on Smoky Hill river and the Kansas Pacific railroad; 900 sq.m.; formed after the census of 1870.

GOVERNMENT, Cost of. The *per capita* annual cost of general and local government was estimated before the American war of the rebellion, to be, in the United States, general, 97 cts.; state, 50 cts.; city or town, 92 cts.; in all, \$2.39. In England it was stated at \$12.33; in France, \$7.50.

GOVERNMENT'S ISLAND. See **ROCK ISLAND**.

GOVERNOR, in mechanics, a piece of mechanism to govern the speed of a machine or engine. It is usually applied to steam engines. The ordinary method is to make use of centrifugal force, by which two suspended metallic balls, by their rise and fall, increase or decrease the admission of steam to the cylinder. See **STEAM ENGINE**.

GOVERNOR'S ISLAND, in Boston harbor, occupied entirely by the national government for purposes of defense. The principal fortification is fort Winthrop.

GOVERNOR'S ISLAND, in the bay of New York, near to the lower point of the city. It is one of the islands occupied entirely by the general government for military and naval purposes. The forts are Columbus, castle William, and the south battery. There are some fine buildings for the principal officers, and the island is usually the head-quarters of the military division of the Atlantic. The ordnance department has a depot there.

GOVINDA, SINGH, b. 1661, at Patna, Behar; a teacher and reformer of the Sikh sect. After spending twenty-five years in the mountains in the study of the Koran and Hindu religious works, he proclaimed himself a special messenger from God. He was opposed to caste, the worship of saints and images, and taught the divine unity. He made many converts to the sect of the Sikhs. Abandoned by his allies when at war with the Mongols, and his stronghold Tehaukor having been taken, he fled, disguised as a dervish, to the desert of Bhutinda, where he was reinforced by many of his friends. He was afterwards made governor of a province by the emperor Bahadur Shah, but soon died. He wrote several religious works.

GOWER, or **Gwyr**, a peninsula in s. Wales, projected 15 m. into the British channel, and forming the extreme w. portion of Glamorganshire. It is about 5 m. wide. In the time of Henry I., a colony of Flemings settled on this peninsula, and their descendants still retain many of the ancient characteristics. They rarely intermarry with the Welsh.

GOYA, a city in the Argentine confederation, 100 m. s. of Corrientes; pop. about 20,000, of whom 90 per cent are said to be unable to read. The place is on low ground; cattle raising is the main business.

GOZZI, CARLO, 1722-1806; a native of Venice, and brother of the author Gasparo, but of stronger intellectual ability. Before he was sixteen he had written four poems of great length, and many smaller pieces. In 1761, his comedy of *The Three Oranges* had an unprecedented run. Similar pieces followed, until he fairly rivaled the famous Goldoni. Still he was far more popular abroad than at home. A complete edition of his plays was published in 12 vols. (Venice, 1791).

GRACE AT MEAT, the ancient Greeks offered a portion of a dish of meat to their gods before partaking of it themselves. A brief invocation before meals is simply an imitation of the practice of the Savior.

GRACES, or GRACE NOTES, in music are used by composers to develop and increase the effect of some special notes. They are often introduced merely for embellishment, and the term may be applied to trills, turns, beats or springing notes.

GRACIAS Á DIOS, Cape, so called by Columbus who in his fourth voyage found safety from a storm by weathering this point. It is the extreme e. point of Honduras, at the mouth of the river Segovia, about 15° n. and 83° w. There is a tolerable harbor near by.

GRACKLE, or GRAKLE; in America the name applied to several species of the genera, *scolecophagus* and *quiscalus*, though these are more commonly called in the United States and Canada "blackbirds," and some of them "boat-tails." They belong to the family *icteridae*. The best known of these are the rusty grackle, *S. ferrugineus*, which pervades almost the whole of North America, and *Q. purpureus*, the purple grackle or crow-blackbird, of more limited range, for though abundant enough in most parts to the e. of the Rocky mountains, it seems not to appear on the Pacific side. There is also brewer's or the blue-headed grackle, *S. cyanocephalus*, which has a more western range, not occurring to the eastward of Kansas and Minnesota. A fourth species, *Q. major*, is also found to inhabit the Atlantic states as far as North Carolina. All these birds are of exceedingly omnivorous habit, and though undoubtedly destroying large numbers of pernicious insects, are in many places held in bad repute from the mischief they do to the corn crops.

GRADIENTIA, a group of amphibians and allied reptiles placed in an order by Merrem in 1821, but first described and given the name by Laurenti in 1768. The general characteristics are, the having of four legs upon which they run, and do not hop like frogs, and also the retaining during adult life the tadpole-state tail. The group contains some of the animals which by modern naturalists are usually classed under the order amphibia (q.v.), which now comprises four orders: I. The *ophioimorpha* of Owen, *gymnophiona* of Huxley, the *apoda* of older naturalists, a small order of animals having the appearance of huge earth worms. II. URODELLA, *ichthyomorphia* of Owen; *saurobatrachia*, the order of tailed amphibians, which were embraced in Merrem's order of *gradientia*, and including among other animals the Mexican *axolotl*. III. AMOTRA, the *batrachia* of Huxley, and *theriomorpha* of Owen, an order including frogs and toads, animals having no tails, and excluded, therefore, by Merrem from GRADIENTIA. IV. The extinct order LABYRINTHODONTIA, resembling *urodella*, but often of gigantic size, of which the *labyrinthodon*, or *cheirotherium*, is the most striking example. See ZOÖLOGY.

GRÆVIUS, the Latinized form of GRÆFE, JOHN GEOGER, 1632-1703; one of the most learned and laborious writers of his time, b. Saxony. He began his studies in the gymnasium of Pforta, and completed them at the university of Leipzig, under Rivinus and Strauch. Grævius was led to the study of letters by his natural inclination, and every day he became more and more devoted to this pursuit. But his father wished that he should study the law; Strauch seconded this view, and Grævius obeyed, though with repugnance. He had the curiosity to visit Hoiland, while Salmasius, Heinsius, and Frederic Gronovius, were in the zenith of their reputation. The conversation of Gronovius revealed to him the painful truth that his studies had been almost entirely unavailing, that he had been taught according to the principles of a bad school, and that he had no time to lose if he desired to correct the vices of its method of instruction. He entreated Gronovius to become thenceforth his guide; so, having abandoned jurisprudence, he passed two years at Deventer, attending assiduously the lessons of his new master. He then proceeded to Amsterdam to hear Alexander Morus and David Blondel, whose counsels decided him to quit Lutheranism for the sect of Calvin. Grævius, whose reputation had now begun to be extended, was, in 1656, called to the university of Duisburg; and he had been there two years, surpassing all the hopes which had been conceived of his talents, when Gronovius, who had entered the university of Leyden, solicited the magistrates of Deventer to appoint Grævius his successor. They agreed to this application, and Grævius, notwithstanding the efforts of the elector of Brandenburg, who, in order to retain him, offered an augmentation of fees, quitted a university for a simple gymnasium, influenced probably by a desire of living under a free government. After a stay of three years at Deventer, he yielded to the solicitations of the university of Utrecht, which offered him the chair of history, then vacant by the death of Æmilius. This satisfied all his ambition, and, content with his situation, he declined the invitations of the magistrates of Amsterdam and Leyden, who twice attempted, by brilliant

offers, to attach him to the schools in those cities. The elector-palatine, who wished to draw him to Heidelberg, was also refused; the king of Prussia was not more fortunate; and the republic of Venice, which offered him a chair in the university of Padua, had as little success, although, in the hope of inducing him to accept, it had promised him, besides considerable appointments, full liberty on the score of religion, and complete protection against the inquisitors. But none of these offers could overcome his resolution. The eager desire of foreigners to obtain his services was justified by the great reputation which he had attained as professor. Pupils crowded to his lectures, not only from all Holland, but from all Europe. In Germany particularly, almost all the great lords sent their sons to be educated by him; and he reckoned amongst his auditors sons of princes and even kings; for William III., who made him his historiographer, had confided to his care the young prince of Nassau. [*Encyc. Brit.*, 8th edit.]

GRÄFE, ALBRECHT VON, 1828-70; son of Karl Ferdinand, an oculist, professor of ophthalmology in Berlin university. He had remarkable practical skill, and published many important papers on the eye and its diseases.

GRÄFE, ALFRED KARL, b. 1830; nephew and assistant of Albrecht; graduated at Halle, where he became a professor. He founded there an ophthalmic hospital which attracted many thousands of patients. He has published books and papers on ophthalmology.

GRÄFE, KARL FERDINAND VON, 1787-1840; b. Warsaw; graduated at Leipsic, and in 1811 was professor of surgery in Berlin. He superintended Napoleon's military hospitals, and after the war was on the medical staff of the army. In England he was warmly received, being the guest of George IV. He went to Hanover to perform an operation on the eyes of the crown prince, but died suddenly. He revived the surgical operation of replacing portions of the face removed by disease, or otherwise by skin taken from other parts of the same body, and wrote a work advocating this treatment entitled *Rhinoplastik*.

GRAFTON, a co. in w. New Hampshire, bordering on Vermont, drained by the Pemigewasset and the lower Ammonoosuck, and crossed by the Concord and Montreal, and the Northern railroads; 1463 sq.m.; pop. '70, 39,103; in '80, 38,790. The surface is rough, embracing several high peaks of the White mountains. Squam lake is one of the physical features. The productions are mainly agricultural, but considerable manufacturing is done. An immense quantity of maple sugar is produced here annually. Co. seat, Haverhill.

GRAFTON, a t. in Worcester co., Mass., on the Blackstone and Quinsigamond rivers, and the Boston and Albany, and Providence and Worcester railroads; 38 m. s.w. of Boston; pop. '80, 4,030. There are extensive manufactories of boots and shoes, cotton-mills, churches, banks, newspapers, and a high school.

GRAFTON, JOSEPH, 1757-1836; b. Newport, R. I. He worked at sail-making, his father's trade, at the age of 14. In 1776 he commenced preaching as a Congregationalist, but in 1787, joined the Baptists, and in the following year was ordained pastor of the First Baptist church, Newton, Mass. He was one of the founders and a trustee of the Newton theological seminary. His ministry of nearly 50 years was very successful.

GRAHAM, a co. in n.w. Kansas, on the s. fork of Salmon river; 900 sq.m.; pop. 96. It is a wild and but little settled region.

GRAHAM, a co. in w. North Carolina, bordering on Tennessee, intersected by Little Tennessee river; 300 sq. miles. It is rough, and in some parts mountainous, with good soil in the valleys. Co. seat, Robbinsville.

GRAHAM, CHARLES K., an American engineer and soldier, b. in New York city in 1824. After completing his college course, he entered the U. S. navy as a midshipman. The war with Mexico breaking out shortly afterwards, the vessel to which he was attached was sent to take a part therein. He now began to study engineering, and when the war ended he returned to New York and placed himself under competent instructors until he had mastered his chosen profession. He was for several years constructing engineer of the Brooklyn navy-yard. The dry-dock and landing-ways of that establishment were constructed under his supervision. When the rebellion of 1861 broke out, he volunteered his services to defend the government, and entered the army of the Potomac as maj. of Excelsior guard. In the battle of Gettysburg he served as brig.gen., and was severely wounded. Recovering from his wounds, he again enlisted, and was assigned by gen. Butler to the command of a gun-boat flotilla, and ordered to proceed to Bermuda Hundred, on James river, and hold the place until the navy could have time to arrive. In this movement he was successful. Subsequently, till the close of the war, he was actively engaged in the field. After the war was over, he returned to New York and resumed the practice of his profession. In 1873, he was appointed chief engineer of the department of docks.

GRAHAM, ISABELLA, an eminent philanthropist, b. in Lanarkshire, Scotland, July 20, 1742; d. in New York July 27, 1814. Her maiden name was Marshall; her husband, John Graham, to whom she was married in 1765, was a British army surgeon, who died in Antigua in 1774. Mrs. Graham afterwards taught school in Paisley and in Edin-

burgh, but in 1789 came to New York and established a school for young ladies. *The Penny society* of Edinburgh, which was afterwards developed into *The society for the relief of the destitute sick*, was organized by her instrumentality; and on coming to New York she engaged in promoting the organization of similar societies. *The society for the relief of poor widows; the orphan asylum society; the society for promoting industry among the poor; and the first Sunday school for ignorant adults*, were all organized partly or wholly through her instrumentality. She was the first president of the *Magdalen society*, and was very active in missionary labors among the poor. Her memoirs, written by the rev. Dr. Mason, were published in 1816, and her letters and correspondence, prepared by her daughter, Mrs. Bethune, appeared in 1838.

GRAHAM, SYLVESTER, 1794-1851; b. Conn. He studied at Amherst, and about 1826 entered the ministry of the Presbyterian church. A few years later he became a temperance advocate, and based his cure for alcoholism upon the facts of physiology and proposed radical reforms in diet. His main points were entire abstinence from meat, and an improvement in the making of bread. *Graham bread* has become a settled name for the article made of unbolted wheat flour. He published several works, among which were *The Science of Human Life; Chastity; Bread and Bread Making;* and one volume of *Philosophy of Sacred History*.

GRAHAM, WILLIAM ALEXANDER, 1804-75; b. N. C., and bred to the law. He was a member of the state legislature, where he was speaker of the lower house; was chosen to the U. S. senate in 1841, governor of North Carolina, 1845-49, and under president Fillmore was secretary of the navy until June, 1852. When gen. Scott ran for president in 1852, Graham was on the ticket as candidate for vice-president. His last public office was that of senator in the confederate congress.

GRAHAME, JAMES, 1790-1842; b. in Scotland, and practiced law. In 1826, he began a history of the United States which he brought down to 1776. The work has been several times republished, and has received high praise. He was attacked by Bancroft the historian, and defended by Josiah Quincy in a special volume. Grahame was partial to America, and coveted the name of American citizen. He wrote against slavery, and made a special defense of the Scottish Covenanters from the charges and insinuations in *Scott's Tales of my Landlord*.

GRAIN, the smallest of weights in the English system, there being 5,760 in a troy and 7,000 in an avoirdupois pound. The name came from a grain of wheat, of which 32 taken from the best part of the ear and thoroughly dried were declared by parliament (in 1266) to make a pennyweight, 20 pennyweights an ounce, and (at that time) 12 ounces a pound. It takes nearly $15\frac{1}{2}$ (15.452) grains to make a grain of metric weight.

GRAIN ELEVATOR, a system of machinery run by steam or other power, consisting of an endless chain or belt for unloading grain from canal-boats, ships, cars, etc. The grain is raised by a continuous line of scoops or buckets, attached to the belt, and which deposit it in enormous bins, from which it is easily run into ships for export. In New York and Chicago these grain elevators are remarkable for their vast capacity for handling and storing grain.

GRAINGER, or GRANGER, a co. in e. Tennessee between Holston and Clinch rivers, including the high ridge known as Clinch mountain; 300 sq. m.; pop. '70, 12,412-1030 colored. The surface is hilly, but the valleys are fertile, producing corn, oats, etc. Co. seat, Rutledge.

GRAMMONT, ORDER OF (or Grandmontains), monastics established at Limoges, France, in 1076, by the monk Stephen of Thiers, who was called *the corrector*. Gregory VII. brought them under the Benedictine rule, and at one time the order was strong in numbers and influence; but, like many others, it pined away, became corrupt, and disappeared with the revolution.

GRAMONT, or GRAMMONT, ANTOINE AGENOR ALFRED, Duc de, formerly duc de Guiche, b. Paris, 1819. He studied in the polytechnic school, but did not enter the army. In 1852 he was sent as minister to Cassel, and successively on diplomatic capacity to Stuttgart, Turin, and Rome. In 1861 he went as ambassador to Austria, remaining at Vienna nine years. In 1870 he was minister of foreign affairs in the Ollivier cabinet. When that cabinet resigned, he retired from public life. In 1873 he was made gen. of division. In 1877 he became a commander in the legion of honor.

GRAN, a co. in n.w. Hungary, on both sides of the Danube and the Gran; 424 sq. m.; pop. '70, 65,306, nearly all Magyars. The soil is for the most part fertile, and the main productions are corn, fruits, and wine. Coal, limestone, and valuable marbles abound. Co. seat, Gran.

GRANADA, a province in s. Nicaragua, on the Pacific and Nicaragua lake; 2,943 sq. m.; pop. 56,000. Its surface is for the most part a table-land, gradually descending towards the lake, and more abruptly towards the ocean. The territory is nearly equally divided by a low mountain ridge, in and near which are several active and quiescent volcanoes. Lake Nicaragua is the largest body of water. Minerals are abundant, and there are many mineral springs. Capital, Granada.

GRAND, a co. in n. Colorado, bordering on Wyoming, drained by the North Platte, and South and Green rivers, and including the great table-lands of Middle park and North park. The co. is otherwise mountainous; gold and silver are plentiful; hot and sulphur springs are numerous. Co. seat, Hot Sulphur Springs.

GRAND ALLIANCE, a compact between the Dutch states-general and the emperor of Germany, signed at Vienna, May 12, 1689, afterwards assented to by Spain, England, and the duke of Savoy. The object was to prevent the union of France and Spain in one monarchy.

GRAND BANK, an elevated plateau in the Atlantic ocean, stretching from Newfoundland towards the coast of Europe, and of undefined extent. It is by some scientists supposed to be composed in part of deposits of solid matter brought from the arctic seas by icebergs. The British and French submarine cables lie along this elevation. Near the American coast the grand bank is noted as the favorite resort of codfish.

GRANDE RONDE, THE, a valley in Oregon, in Union co., near the n.e. corner of the state drained by the river of the same name, and bounded on the w. by the Blue mountains. In the valley are about 430 sq.m. of fertile land, and abundance of timber is found in the surrounding hills.

GRAND FORKS, a co. in n.e. Dakota, w. of the Red river of the n., organized after the census of 1870, about 2,270 sq.m.; surface is nearly all prairie, and timber is scarce. The region is very little settled. Co. seat, Grand Forks.

GRAND HAVEN (*ante*), a city and seat of justice of Ottawa co., Mich., on Grand river, where it falls into lake Michigan; 112 m. n.e. of Chicago, on the Michigan lake shore, and the Detroit and Milwaukee railroads; pop. 4,363. It has a good harbor, a court-house, about a dozen churches, many lumber mills and other manufactories. A magnetic spring is much visited in the summer season.

GRAND ISLE, the n.w. co. of Vermont, bordering on Canada and on lake Champlain, intersected by the Vermont central railroad; 80 sq.m.; pop. '80, 4,124. Within the territory are several small islands in the lake. The surface of the co. is uneven, and the soil fertile; productions, oats, hay, wool, and butter. Co. seat, North Hero.

GRAND JURY (*ante*), a body of men summoned by a sheriff whose function it is, upon such evidence as the attorney of the state may present, to determine whether persons accused of crime, shall be indicted and tried therefor, and to inquire into such other matters as may be confided to them by the court, or come to their knowledge. They do not examine witnesses for the defense, for it is not their duty to find a verdict, but only to decide if there is *prima facie* evidence of guilt, such as to warrant a trial. In all essential particulars this institution in the United States is the same as it is in England, but upon minor points, there are in practice some differences. The number of men required to constitute a grand jury is not the same in every state, but varies from 12 to 23. The court may in its discretion select the foreman or allow the jurymen to do so. The foreman first, and then the other members of the jury, take the following oath: "You do swear (or affirm) that you will diligently inquire, and true presentment make, of all such articles, matters and things as shall be given you in charge, or otherwise come to your knowledge, touching the present service; the commonwealth's counsel, your fellows, and your own, you shall keep secret; you shall present no one for envy, hatred, or malice; nor shall you leave any one unrepresented for fear, favor, affection, hope of reward or gain; but shall present all things truly, as they come to your knowledge according to the best of your understanding." Having been sworn and received a charge from the court explanatory of their duties, they retire to their room. The foreman presides, and it is usual to appoint one of the members as secretary, to keep a record for their own exclusive use. Bills of indictment against offenders are then laid before them by the state's attorney, and on the backs of the same are written the names of the witnesses by whose testimony they are supported. The witnesses are examined under oath, and if their testimony is deemed sufficient in any case to establish a fair probability of guilt, the foreman writes on the back of the indictment, "A true bill," signs his name and affixes the date. If the evidence is not sufficient, he writes on the back of the indictment the words "Not a true bill," or other words meaning the same thing. To find a true bill 12 of the jury must concur. Witnesses misbehaving themselves must be reported to the court, which may commit them for contempt if the offense is sufficiently grave. The jury must attend until discharged by the court.

GRAND LAKE, a large but shallow body of water in Louisiana, emptying through a tortuous lagoon into Atchafalaya bay.

GRAND LAKE, sometimes called Schoodic lake, in Maine, on the border of New Brunswick, the greater part in Washington co. Its waters pass into St. Croix river.

GRAND MANAN, or **MEXAN**, an island in the Atlantic off the Maine coast, belonging to New Brunswick and embraced in Charlotte co.; pop. '71, 1,867. It is about 20 by 5 m. with abundance of timber, and excellent facilities for ship building. Fishing is one of the leading occupations of the inhabitants.

GRAND MONADNOCK, a mountain in Chelsea co., N. H., rising 3,718 feet. It is an isolated peak, and a conspicuous landmark, offering from the top a wide and picturesque view.

GRAND-PIERRE, JEAN HENRI, D.D., 1799-1874; b. Switzerland, educated in Neufchatel and Tübingen; became pastor at Bâle and was an intimate friend of Vinet. In 1827 he went to Paris and was president and professor of languages in the theological seminary, and was soon recognized as one of the most eloquent of pulpit orators. His last 20 years were passed as pastor of l'Oratoire, the greatest of Protestant churches in the French capital. After Monod's death he was leader of the orthodox branch of the Reformed church. Louis Philippe granted him letters of naturalization, and Louis Napoleon made him a member of the legion of honor. In 1838 he was granted the degree of doctor of divinity by the college of New Jersey. He visited the United States twice, and in 1850 published *A Glance at America*. With his family he endured the siege of Paris (in the Franco-German war) and the horrors of the commune. Among his works are *Christian Doctrine; Christian Life; Unity and Variety; Sorrow and Consolation; Guide to Faith; Essay on the Pentateuch; Souvenirs of an Old Pastor*, etc.

GRAND PRÉ, a village in Nova Scotia, in Kings co., on the basin of Minas, reached by the Windsor and Annapolis railroad, 15 m. from Windsor; pop. about 600. It is notable chiefly as the central scene in Longfellow's pastoral poem *Evangeline*.

GRAND RAPIDS (*ante*), a city and seat of justice in Kent co., Mich., on Grand river at the junction of seven railways, 158 m. w. of Detroit; pop. '74, 25,989. The river and canals on either shore furnish abundant water power, and there are many large manufactories of lumber, furniture, cooper's work, wooden ware, farming tools, iron, leather, flour, machinery, bricks, cement, plaster, chemicals, beer, etc. The plaster is got from gypsum deposits in the neighborhood. The city is tolerably well built, and is the center of an important trade. It has a fine court-house and post-office, churches, and public schools.

GRAND RIVER, a tributary of the Colorado, rising in Middle Park, s. Dakota, passes into Utah in a s. w. direction crossing the s. e. section of the territory, then into Arizona and after a course of about 390 m. unites with the San Juan to form the Colorado of the w., so famous for its wonderful cañons. There are some large cañons on Grand river also.

GRAND TRAVERSE, a co. on Grand Traverse bay in n. w. Michigan, 500 sq. m.; pop. '74, 5,349. The surface embraces a number of lakes and large areas of timber, among which are sugar-maple and white pine. The main article of export is lumber. Co. seat, Traverse city. Grand Traverse bay, is an offshoot of lake Michigan extending s. 30 m. by 12 m. wide. Grand Traverse river, rises in Kalamazoo co., and after a short course w. and n. empties into the bay of the same name.

GRANGE, a word which primarily means a granary or storehouse for grain, but which has been broadly used as signifying an estate with all the buildings thereon; used in the United States since 1867, as the familiar name of the state and subordinate organizations of the "patrons of husbandry," a national association of agriculturists, of which Mr. O. H. Kelley, a native of Boston, is the reputed founder. The society originated in the depressed condition of agriculture following the war of the rebellion, and was especially designed to redress the grievances of farmers at the west on account of the alleged injustice of the railroad companies in their charges for carrying agricultural freight, and on account of the exorbitant prices paid to middlemen for handling such freight and for supplying agricultural implements and stores. The plan of the organization, which is somewhat like that of the odd-fellows, was formed by Mr. Kelley and Mr. William Saunders, who were connected with the department of agriculture in Washington, and was designed to bring the farmers of the country into active co-operation for mutual protection. The plan embraced a common ritual, with secret ceremonies of initiation, to be observed by the local associations, which are subordinate to the national body. Each grange elects its own officers, women being admitted to membership equally with men, but no one of either sex being eligible unless interested in agricultural pursuits. The national and state granges meet annually, the local ones monthly or oftener. The order has its greatest strength in the north-western states. In 1875 the total number of granges was estimated at 30,000, with a membership of nearly 2,500,000. In 1874 the national grangers issued a manifesto declaring the objects of the order to be "to develop a better and higher manhood and womanhood among ourselves; to enhance the comforts and attractions of our homes; to buy less and produce more, in order to make our farms self-sustaining; to discountenance the credit system, the mortgage system, the fashion system, and every other system tending to prodigality and bankruptcy; to secure harmony, good-will, and vital brotherhood among ourselves, and to make our order perpetual." The order is social and economic, and neither political nor sectarian. Through the influence of its members, laws were passed in Illinois and Wisconsin putting railroad companies under sharp restrictions as to their charges for carrying agricultural products; but some of these laws were declared to be unconstitutional by the courts, and the order has accomplished far more by moral and social influence than by legislation. The benefits conferred by it upon the agricultural

community are believed to be very great. The system of co-operation which it has fostered has assisted not a few farmers in their efforts to get out of debt, and developed a spirit of enterprise and co-operation which is of inestimable value. But, notwithstanding this, the order is understood to have declined in the last few years. Whether this is because it is somewhat overweighted with its own machinery of organization, or because other objects have, for the time being, absorbed the attention of its members, is not here affirmed. Certainly there is no diminution of the popular interest in agriculture, and it is believed that farmers as a class are as keenly alive to their interests now as at any previous time.

GRANGER, FRANCIS, 1792-1868; son of Gideon, b. Connecticut. He removed in early life to western New York and practiced law. He was a member of the assembly and a prominent leader in the anti-masonic movement; became a leader in the whig party and a member of congress, and in 1841 was appointed postmaster-general. His last appearance in political life was as one of the leaders of the small section known as "silver gray" whigs, who opposed the drift of the party toward active opposition to slavery.

GRANGER, GIDEON, 1767-1822; b. Conn.; graduated at Yale, and admitted to the bar in 1788. He was for several years a member of the legislature, and conspicuous in efforts to promote education by establishing a school fund. In 1801 he was made postmaster-general, holding the office until 1814. In New York he was state senator, and a warm supporter of De Witt Clinton's plans for internal improvement.

GRANGER, GORDON, 1821-76; b. New York; a graduate of West Point; was transferred to the mounted rifles in 1846; was in the siege of Vera Cruz, and the battles of Cerro Gordo, Contreras, and the capture of Mexico. In 1861 he was a capt. of cavalry. In the war of the rebellion he served with distinction in several battles, and in 1862 became maj.gen. of volunteers. He was in the battle of Chickamauga, at Missionary ridge, and the siege of fort Morgan and capture of Mobile; subsequently he was department commander in Texas and Kentucky. In 1866 he was made col. of infantry.

GRANGER, ROBERT S., b. Ohio, 1816; graduate of West Point; served in the Florida Indian war; was tutor at the military academy; for many years on the frontier; in the war of the rebellion, col. of Kentucky volunteers (union), and participated in many skirmishes and battles. In 1871 he was appointed col. of infantry, and two years afterwards was placed upon the retired list.

GRANIER DE CASSAGNAC, PAUL, b. 1840 or '41. He began when quite young to write for newspapers, and soon became noted for the fierceness of his personal attacks on his contemporaries and the duels to which such attacks often led. In 1866, under the patronage of his father, he joined the editorial staff of *Le Pays*, an influential journal of Paris, and not long after became the principal editor. From that period to the present he has pursued a course so aggressive as to be in an almost continuous series of quarrels, particularly with editors and writers of the anti-Bonapartist side. One of his several encounters was with Gustave Flourens in 1869. In 1868 Louis Napoleon gave Cassagnac the decoration of the legion of honor, and the next year he became member of the general council for Gers. In the German war he served as a volunteer in the zouaves, was captured at Sedan, and kept a prisoner in Silesia for eight months. When free he resided for a time in Vienna, then went to Gers and established *L'Appel au Peuple*, a violent political journal. In 1872 he resumed his chair as editor of *Le Pays*, but within a brief period he was again in a duel (with M. Lockroy), for which he got a week's imprisonment and a fine of 100 francs. In 1873 he fought M. Ranc, a journalist, when Ranc was disabled and Cassagnac was slightly wounded. In 1874 he was tried for printing articles calculated to disturb the peace, on which occasion he conducted his defense in person and was acquitted, an event looked upon by the imperialists as a signal triumph. In 1874 he violently criticised gen. Wimpffen for the surrender of Sedan. The officer prosecuted for libel, but the editor was acquitted. In 1876 and 1877 he was returned to the national assembly for Gers.

GRANT, a co. in s. central Arkansas on Saline river; 650 sq.m.; pop. '70, 3,943—339 colored. The surface is hilly, and to a large extent covered by forests. The chief productions are cotton, corn, hay, and pork. Co. seat, Sheridan.

GRANT, a co. in e. Dakota, on the Minnesota border, s.w. of Big Stone lake. It is unsettled, and almost destitute of forests.

GRANT, a co. in n.e. Indiana on the Mississinewa river, crossed by the Pittsburgh, Cincinnati, and St. Louis, and the Cincinnati, Wabash, and Michigan railroads; 420 sq.m.; pop. '70, 18,487. It is mostly level and fertile; about a third being woodland. Corn, wheat, oats, and pork are the main products. Co. seat, Marion.

GRANT, a co. in s.w. Kansas, on the Cimarron river and its branches; 576 sq.m.; formed after the census of 1870. It consists almost entirely of prairies.

GRANT, a co. in n. Kentucky, drained by Eagle creek and crossed by the Cincinnati Southern railroad; 200 sq.m.; pop. '70, 9,529—509 colored. Surface undulating and soil fertile, producing corn, wheat, hay, etc. Co. seat, Williamstown.

GRANT, a parish in central Louisiana, on Red river and Saline bayou; 500 sq.m.; pop. '70, 5,417—2,414 colored. The surface is mostly level, and the soil fertile. The main productions are cotton and corn. Seat of justice, Colfax.

GRANT, a co. in w. Minnesota on the Mustinka and Pomme de Terre rivers, crossed by the St. Paul and Pacific railroad; 625 sq.m.; pop. '80, 3,004. The surface is undulating prairie, with many small lakes. The soil is fertile and favorable for wheat. Co. seat, Elbow Lake.

GRANT, a co. in the extreme s.w. of New Mexico between the Rio Grande and Arizona, drained by the Gila; about 10,000 sq.m.; pop. '70, 1143. The surface is rough and in some parts mountainous, with fertile valleys. Wheat, corn, and grass are the chief products. Water and timber are scarce on the high lands. The precious metals and copper are found. Co. seat, Pinos Altos.

GRANT, a co. in e. Oregon, on the John Day river; 21,000 sq.m.; pop. '80, 4,303. The surface is rough, the Blue mountains occupying a considerable area. Cattle, wheat, and lumber are the chief products. Gold has been found in large quantities. Co. seat, Cañon City.

GRANT, a co. in n.e. West Virginia, drained by affluents of the Potomac and traversed by branches of the Alleghany range; 460 sq.m.; pop. '70, 4,467,—331 being colored. Some portions are fertile, producing wheat, corn, and cattle. Co. seat, Maysville.

GRANT, a co. in s.w. Wisconsin between the Mississippi and Wisconsin rivers and drained by the Platte and Grand; 1100 sq.m.; pop. '75, 39,086. The surface is varied and the soil very fertile, producing corn, wheat, oats, etc. Co. seat, Lancaster.

GRANT, JAMES, b. Edinburgh 1822. While a boy he was for several years with the British army in Newfoundland, was made an ensign, and, in 1840, had charge of the military depot at Chatham. He left the service to devote his attention to literature, and the study of Scotch antiquities. His first work (1846) was *The Romance of War, or Highlanders in Spain*. This was followed in rapid succession by more than 40 different works, of which the more important are *Adventures of an Aide de Camp*; *Kirkcaldy of Grange*; *Memoirs of the Marquis of Montrose*; *Walter Penton, or the Scottish Cavalier*; *Bothwell, or the Days of Mary Queen of Scots*. Many of his books are on martial themes but among them are a number of novels. A considerable number have been reprinted in the United States. In 1875 Grant left the Protestant church and became a Roman Catholic.

GRANT, JAMES AUGUSTUS, b. Scotland 1827; educated at Aberdeen; served in the English army in India, and was with gen. Havelock at Lucknow. In 1863 he was with Speke in exploring the sources of the Nile. In the Abyssinian expedition he was at the head of the intelligence department under lord Napier. He has published *A Walk Across Africa*; *Botany of the Speke and Grant Expedition*, and various papers in the scientific journals.

GRANT, Sir JAMES HOPE, b. Scotland 1808; served in the British army in the first Chinese war, and through the Punjab campaign in 1848-9. In 1858 he was made maj.gen. He was distinguished at the siege of Delhi, and the relief of Lucknow, and also in movements at Cawnpore. He directed and brought to a successful close the British campaign in China which terminated with the capture of Peking in 1860. In 1861 he was lieut.gen. and commander-in-chief at Madras. He has published *Incidents in the Sepoy War*.

GRANT, ULYSSES SIMPSON (*ante*), the most famous of American soldiers, and president of the United States from Mar. 4, 1869, to Mar. 4, 1877, won his great reputation in the war of secession, into which he entered as the col. of an Illinois regiment, and out of which he came as the successful leader of the national armies, and holding a place in the hearts of his countrymen hardly less exalted than that so long held by Washington. He is of Scotch ancestry, from which he no doubt inherited the qualities that fitted him to conquer the most formidable rebellion of either ancient or modern times. Educated at West Point, he did good service as a subordinate officer in the war with Mexico, resigning a few years afterwards and entering upon an inconspicuous career, first as a farmer in the neighborhood of St. Louis, and afterwards as a leather merchant in Galena. In the latter position he was found when the war of the secession began in 1861. He promptly offered his services to the government without stipulation or reserve, and of all those who knew him there was probably not one who had the slightest suspicion that he would develop a great capacity for military leadership. It may even be doubted that he himself had any anticipations of the career so soon to open before him. If his breast heaved with great hopes and ambitions, the reticent man kept them strictly to himself and went quietly to the discharge of whatever duty he was required to perform. In looking now at the early stages of his career, we see an exhibition of the pluck and pertinacity as well as the shrewd common sense that were afterwards so conspicuous. He was faithful in the few things he was at first called to undertake, thus proving his capacity for higher duties. There is no evidence that he ever sought to push his fortunes at the expense of other commanders, or that he was in

haste to rise faster than the government discovered cause for his promotion. His victories were always modestly announced, without the least sign of a purpose to draw attention to himself or win the applause of his countrymen. If he was aware that such modesty on his part was more likely to kindle the admiration of the country than any amount of boastfulness, it is only another evidence of his high soldierly qualities and of his superiority over those who, for want of such perception, were constantly creating obstacles to their advancement. He went quietly and submissively to the discharge of whatever task was assigned him, never grumbling over difficulties, or asking to be placed in a more conspicuous or honorable position. In nothing more than this did he show the qualities of a great soldier, by nothing else did he more endear himself to his countrymen. He was in this respect a gen. after Lincoln's own heart, and it is no wonder that the latter discerned his merits and charged him with greater and greater responsibilities, until at last he exalted him to the post of commander of all the forces in the field. Shortly after entering the service he was advanced from the position of col. to that of brig.gen. of volunteers and assigned to the command of the forces at Cairo. Sept. 6, 1861, he seized Paducah, at the mouth of the Tennessee, and on the 25th, Smithland, at the mouth of the Cumberland, two important strategic points. His next move, a month later, was to check the advance of a rebel force under gen. Jeff. Thompson, which was successfully accomplished by two battles, one at Fredericktown, Mo., the other at Belmont, in the latter of which he had a horse shot under him. The district of Cairo was now enlarged and gen. Grant confirmed in command thereof. In Feb., 1862, he moved from Paducah with 15,000 men, aided by commodore Foote with a fleet of gunboats, for the purpose of capturing fort Henry, on the Tennessee, and fort Donelson, on the Cumberland. The former surrendered Feb. 6, its reduction being mainly the work of the gunboats; the latter was taken on the 16th only after a severe battle in which the land forces were engaged. Buckner, who was in command of the fort, proposed the appointment of commissioners to settle the terms of capitulation; to which gen. Grant replied: "No terms other than an unconditional and immediate surrender can be accepted. I propose to move immediately upon your works." The capture of this fort was the first important and brilliant victory of the federal arms, and it made a great impression upon the country. Gen. Grant was at once made a maj.gen. of volunteers, his commission being dated on the day of the battle. The battle of Pittsburg Landing was next fought. The union forces at that point had lost their commander by death, and while halting were attacked April 6 by a large confederate force under Albert Sidney Johnston and beaten with heavy loss. Gen. Grant arrived on the field at the critical moment and reformed the broken union lines, and heavy re-inforcements under gen. Buell having arrived, the battle was renewed on the 7th and the confederates driven back to Corinth. The loss on each side in this battle was 12,000 men, and gen. Grant was slightly wounded. Gen. Halleck being called to Washington, gen. Grant was assigned to the command of the department of west Tennessee, with headquarters at Corinth, which the confederates had evacuated. Here he was much annoyed by spies and guerillas, against whom he adopted the most energetic measures. He next fought the confederate gen. Price at Iuka and defeated him. He then removed his headquarters to Jackson, leaving Rosecrans with 20,000 men to hold Corinth, which he did successfully, though attacked by a force twice as great as his own. In Oct. gen. Grant's department was enlarged by a portion of Mississippi, including Vicksburg, the forces under his command being designated as the 13th army corps. After several unsuccessful efforts to capture Vicksburg, it was besieged May 18, and surrendered July 4, 1863, with about 27,000 prisoners. Gen. Grant was now appointed a maj.gen. in the regular army, and in Oct. placed in command of the military division of the Mississippi, comprising the departments commanded by Sherman, Thomas, Burnside, and Hooker. His next exploit was the defense of Chattanooga by driving the forces of Bragg from Missionary ridge and Lookout mountain. Gen. Halleck, in his annual report to the war department, said that in view of the strength of the rebel position and the difficulty of storming his intrenchments, "the battle of Chattanooga must be considered the most remarkable in history. Not only," he continues, "did the officers and men exhibit great skill and daring in their operations on the field, but the highest praise is due to the commanding gen. for his admirable dispositions for dislodging the enemy from a position apparently impregnable." Congress at its next session promptly returned thanks to gen. Grant and his army, and ordered a gold medal to be struck in his honor. Congress also revived the grade of lieutenant-gen. in the army, whereupon gen. Grant was nominated by president Lincoln for the position, and the nomination promptly confirmed by the senate. He came to Washington, received his commission at the hands of president Lincoln, and returned with all speed to Tennessee. In a letter to gen. Sherman, written after his appointment, he frankly acknowledged his success in the field was "due to the energy, skill, and the harmonious putting forth of that energy and skill, of those whom it has been my good fortune to have occupying subordinate positions under me." His first general order as commander was issued Mar. 17, 1864, and announced that his headquarters would be in the field, and, until further orders, with the army of the Potomac. The war, which had existed for three years, and been attended with immense sacrifice of life and property, and an unwavering hope of final victory for the union and liberty, was now approaching its culmination. The successes

of gen. Grant in subordinate positions had awakened among the northern people a perfect assurance that, as commander of all the union forces, he could not fail to bring the conflict to a speedy and honorable conclusion. His quiet confidence in himself was sustained by the hearty devotion of the army and the support of a united people. The battles of the next year, which had for their object the capture of Richmond, at which point the secessionists had concentrated their main army for a last and desperate resistance, were the bloodiest of the whole war. The first movements of gen. Grant, though unsuccessful as to his main design, resulted in crippling the enemy and so preparing the way for final victory; but they were attended with great loss of life. In the campaign from the Rapidan to the James, between May 3 and June 15, the union loss in killed, wounded, and missing, was 54,551. The confederate losses are estimated at 32,000. Gen. Grant, having failed in his flanking movements, saw at last that his only hope of seizing Richmond depended upon first taking Petersburg, and to this object he now addressed himself with his usual pluck and pertinacity. Lee attempted to create a division by a movement on Washington, but was foiled and driven back by Sheridan. Sherman meanwhile had forced Hood to evacuate Atlanta, and was on his famous march to the sea. Lee was so effectually beleaguered by Grant in the approach to Richmond that he was unable to send reinforcements to his generals at other points, and the confederacy was rapidly falling to pieces. At length, on April 2, 1865, Petersburg fell, and on the 3d the union forces entered Richmond, the confederates fleeing as they advanced. Grant pursued the flying army, caught and surrounded it, and forced it to surrender at Appomattox court-house, April 9. Lee, with 27,000 men—all that remained of his army—was captured, and the confederacy overthrown. Grant's entire loss in the campaigns of the year was 12,663 killed, 49,559 wounded, and 20,498 missing; total, 82,720. In the same time he had captured more than 66,000 confederate soldiers; how many he had killed and wounded is not known. The terms granted to Lee were most magnanimous, and all the forces of the confederacy made haste to disband on similar conditions. The rebellion was put down, the union restored, and Grant was the hero of the day. The assassination of Lincoln and the accession of Andrew Johnson quickly followed, and then came the excitement of the period of reconstruction, in which gen. Grant, for whom congress had created the rank of gen. of the army, bore a loyal and honorable part. In 1868 he was elected president, receiving 214 electoral votes, to 80 cast for Horatio Seymour. In spite of unfortunate divisions in the republican party, he was re-elected in 1872, receiving 286 electoral votes, while but 42 were cast for the opposing candidate. At the close of his second term, in 1877, he made the tour of the whole civilized world, visiting especially all the great nations of Europe and Asia, and receiving, as a great soldier and civilian and the first citizen of the United States, all the honor which rulers and people could bestow. As the unofficial representative of his country, in the nations he visited his bearing was such as to win universal admiration and respect. His intercourse, moreover, with the rulers and other representative men abroad, was, no doubt, calculated to remove the prejudices and conciliate the good-will of foreign nations toward the great republic of the new world. On his return home in the spring of 1880, a large and influential portion of the republican party sought to make him a candidate for the presidency once more; but the movement was defeated, not because the people did not still admire and trust him, but on account of the formidable opposition to bestowing the office upon any man, however eminent or noble, for more than two terms.

GRANVELLE, ANTOINE PERRENOT, Cardinal de, 1517-86; b. France, but a Spanish statesman. He was the son of the chancellor of Charles V.; was thoroughly educated, and excelled as a linguist. Before he was 25 he was bishop of Arras. At the Trent council he defended his sovereign's policy of war upon France, for which he was made a counselor of state. In 1550 he was chancellor, succeeding his father. As a diplomatist he was engaged in the treaty of Passau, and in arranging the marriage of Philip with Mary of England. When Philip came to the throne, Granville was made chief-minister, and was principal adviser in the affairs of the Netherlands. After Philip left for Spain, Granville became supreme, and soon made his administration odious to the Flemish people, as his whole power was exerted to restore the domination of the church of Rome. He increased his power by bringing in Spanish soldiers, making new bishops, and refusing to call together the general assembly. But when he proposed to establish the inquisition, the wrath of high and low alike centered upon him. He was made a cardinal in 1561. William of Orange, Horn, Egmont, and at last Margaret of Parma (the Spanish regent) asked for his recall. Philip refused, but the unpopular cardinal foresaw trouble and probable danger, and of his own accord asked to be withdrawn. He went to Besançon, and occupied his leisure in literary and scientific studies. Subsequently he negotiated the alliance between Spain, Vienna, and Rome, against the Turks, and was viceroy of Naples. In 1575 he was called back to Spain, and made chief officer of the supreme council, in which capacity he arranged the union between Spain and Portugal, and while Philip was out of the country he acted as regent. He was a patron of literature, and richly endowed the college of Besançon.

GRANVILLE, a co. in n. North Carolina on the Virginia border, crossed by the Raleigh and Gaston railroad, and drained by Tar river; 750 sq.m.; pop. '80, 31,285—

17,683 colored. The surface is hilly and the soil fertile. The main productions are corn, oats, wheat, tobacco, and cotton. Co. seat, Gaston.

GRANVILLE, a t. and village in Washington co., N. Y., on Pawlet river, and the Rensselaer and Saratoga railroad, 66 m. n. of Albany; pop. of township in '80, 4,149. Granville female seminary is in the n. village. Granville proper has some manufactures, good schools, and a number of churches. Near by are quarries of excellent slate.

GRANVILLE, a t. and village in Licking co., Ohio, on Raccoon creek, about 25 m. e. of Columbus, a short distance from a station on the Baltimore and Ohio railroad; pop. of township 2,127. The Denison university (Baptist) in the village, has a fine library. The Granville female college is also a prominent educational institution, and there are good public schools.

GRANVILLE, GRANVILLE GEORGE LEVESON-GOWER, Earl, b. England 1815; educated at Oxford; in 1835 in the embassy to France; the next year in parliament, and re-elected in 1837. In the commons he was a liberal and a free trader. He became a peer in 1846, vice-president of the board of trade in 1848, and went into the cabinet in 1851, at the close of that year succeeding Palmerston in the foreign office. He retired with the Russell ministry. In 1853 he was president of the council, and two years afterwards undertook the ministerial leadership in the house of lords. In 1850 he was vice-president of the royal commission for the great exhibition to which enterprise he rendered important services. In 1856 he was special representative of his government at the coronation of the czar. Besides filling other positions, the earl has been colonial secretary for foreign affairs (succeeding Clarendon). When Gladstone retired from the leadership of the opposition, Granville by general consent, was looked upon as the leader of the liberals.

GRAPE. See VINE, *ante*.

GRAPHOMETER, a name sometimes, though inappropriately, given to the protractor, an instrument used in plotting surveys. It is a semi-circle, marked with 180°, and, in large instruments, with parts of degrees. Its use is to lay off angles. See PROTRACTOR.

GRASSE, FRANCOIS JOSEPH PAUL DE, Count and Marquis de Grasse-Tilly, 1723-88; joined the naval service of the knights of Malta in 1734, serving in Turkish and Moorish wars. In 1738 he entered the navy of France and speedily rose to be rear-admiral and chief of squadron. In 1781 he came to the assistance of the American patriots, and was instrumental in the reduction of Yorktown. Subsequently he served in the West Indies where he was utterly defeated by Rodney, the British commander.

GRASSMANN, HERMANN GÜNTHER, 1809-77; b. Prussia; a mathematician, son of a professor of mathematics in the Stettin gymnasium, to whose chair he succeeded. In 1844 he published the first part of an important mathematical work in which he explained certain discoveries in the science. He has published several other works, the leading purpose of which is to establish a new system of mathematical processes covering wider ground and tending to supersede the plans and theories of Descartes.

GRASS OIL. See CITRONELLA.

GRASS VALLEY, a village in Nevada co., Cal., about 50 m. n.n.e. of Sacramento, in the midst of the richest gold mines of the state; pop. 7,063. It is the seat of a Roman Catholic bishop, and has a convent, a number of Protestant churches, and two orphan asylums. Quartz mills and iron foundries are prominent business establishments.

GRATIANUS, FRANCISCUS, a monk of Bologna of the 12th century. He is known from a collection of decretals or church canons bearing his name. He is charged with extending the power of the papacy by teaching that the pope himself was not subject to the canons.

GRATIOT, a co. in central Michigan, intersected by Prairie river, and crossed by the Saginaw Valley and St. Louis railroad; 576 sq.m.; pop. '74, 13,886. It has an undulating surface and much is yet forest land. The soil is fertile. Lumber, hay, wheat, corn, and oats are the principal products. Co. seat, Ithaca.

GRATIOT, CHARLES, 1788-1855, born Mo.; graduated at West Point in 1806, entering the corps of engineers, and was made capt. in 1808. He was chief of engineers under gen. Harrison in 1813-14, and took part in the defense of fort Meigs, April-May, 1813, and the attack on fort Mackinac, Aug. 4, 1814. He was made maj. in 1815, lieut.col. in 1819, col. and chief of engineers in 1828, and the same year brig.gen. by brevet. He was inspector of the academy at West Point, 1828-38. Dec. 6, 1838, he was dismissed from the service.

GRATRY, AUGUSTE JOSEPH ALPHONSE, Abbe, 1805-72; b. France. He was chaplain of a normal school and director of a college in Paris. With others he founded the "oratory of the immaculate conception," a society of priests, and devoted himself to the instruction of the youth of the city. In 1861 he became vicar-general of Orleans, and two years later professor of moral theology in the Sorbonne. About this time he published a *Course of Philosophy*. He afterwards vehemently opposed Renan and the

rationalists generally. In 1867 he was made a member of the academy. He favored Pere Hyacinthe for a time, and was censured by his superiors.

GRATTONI, SEVERINO, b. Italy 1816; educated as an engineer, and was consulted by Cavour on the Mont Cenis tunnel and other important works. Grattoni became the head director of the great tunnel which was completed in 1871. He was for a time a member of the Italian chamber of deputies.

GRAVELOTTE, BATTLE OF, was fought Aug. 18, 1870, in the Franco-German war, near the village of Gravelotte in Alsace-Lorraine. The first and second German armies under gen. Steinmetz and prince Frederick Charles with king William as commander-in-chief, gained a great victory over the French forces under marshal Bazaine. This battle decided the fate of Metz and was probably the bloodiest of the whole war. The Germans numbering 211,000 lost 904 officers and 19,658 men; the French numbering 140,000 lost 609 officers and 11,605 men.

GRAVEL WALLS, made of a conglomeration of cement, or lime, and pebbles and small stones or slag. They are built in casings and the planks may be taken away after the mass has properly hardened. Apertures for doors and windows should be made while the wall is in process of building.

GRAVES, a co. in w. Kentucky on Clark's river, traversed by the Paducah and Memphis railroad; 515 sq.m.; pop. '70, 19,398—2,329 colored. The region is level and the soil productive; chief productions, wheat, corn, tobacco, cotton, and butter. Co. seat, Mayfield.

GRAVIER, JACQUES, d. 1708; a French missionary in Canada and the wilds of Illinois in the latter part of the 17th century. He continued the work of Marquette among the Indians for several years, but was constantly opposed by the medicine men who found their craft in danger. At length they gave him a wound from which he never recovered. During his labors he went down the Mississippi twice to see Iberville, the Louisiana pioneer. He sailed for Europe in 1706, and returned in 1708. He wrote three works on the Indian missions and Louisiana affairs, and compiled a grammar of the Illinois tongue.

GRAY, DAVID, 1838-61; a poet of Scotland, the son of a poor weaver. David managed to get into Glasgow university, and acquired a fair education. He was for a time private tutor. In 1860 he went to London, where from motives of economy he slept the first night in a park and laid the foundation of the disease from which he died. He had written *The Luggie*, an intensely Scotch poem; but no one felt inclined to read it. Finally Monkton Milnes took pity on him and tried to get the poem into Thackeray's magazine, but the editor rejected it. The sick and disappointed author was sent home by Milnes, and the day before he died he had the satisfaction of seeing a proof-sheet of the first pages of his *Luggie*, which, through Sidney Dobell's influence, had found a publisher. The work, including other poems, was published in London in 1862.

GRAY, FRANCIS CALLEY, LL.D., 1790-1856; b. Mass.; graduated at Harvard, and became a lawyer. When John Quincy Adams was envoy to Russia, Gray was his private secretary. He was a member of the Massachusetts legislature. He took great interest in science, and was secretary of the academy of arts and sciences. In his will he left \$50,000 for a museum of comparative zoology to be a part of Harvard university, besides an investment to secure care of the museum and publication of catalogues and illustrations. In 1848 he published *Prison Discipline*, and from time to time contributed many papers to the *North American Review*.

GRAY, GEORGE ROBERT, b. England, 1808; brother of John Edward (*ante*), and also a naturalist. He was 40 years in the zoological department of the British museum, and has written many papers and some books on natural history, among them the article on entomology in Cuvier's *Animal Kingdom*, *List of the Genera of Birds*, and two others also on birds. His list embraces over 2,900 genera and 11,660 species.

GRAY, HENRY PETERS, 1819-79; b. New York; studied painting with Huntington, and in 1839 traveled in Europe. While there he produced "Thou art Gone," "The Billet Doux," and "The Roman Girl." He returned in 1843, but was again in Europe in 1845-46, when he painted "Teaching a Child to Pray," "Proserpine and Bacchus," and other works. Some of his more important pictures are "Wages of War," "Apple of Discord," "Portia and Bassanio," "Cleopatra," "Origin of the American Flag," and "Genevieve." In 1871 he went to Europe where he remained several years, after which he returned to New York, where he died.

GRAY, ROBERT, 1755-1806; b. R. I. He was the first to carry the American flag around the world, which he did in 1787-90 in the sloop Washington on a trading voyage to the n.w. coast of America and on to China and the west. On another voyage in 1791 he discovered the Columbia river (in Oregon).

GRAY, WILLIAM, 1750-1825; b. Mass.; for many years one of the foremost of Boston merchants, a man of little education but of remarkable natural abilities. At one time he had more than two score large vessels engaged in ocean trade. He was a member of the state senate, and for one term lieutenant-governor. Many anecdotes are

current of his oddities and his utter indifference to the personal pride that usually accompanies great wealth.

GRAYSON, a co. in w. central Kentucky, drained by head waters of Green river, and crossed by the Louisville, Paducah and Southern railroad; 650 sq.m.; pop. '70, 11,580—407 colored. The surface is nearly level with tolerably fertile soil. Chief productions, corn, tobacco, and pork. Limestone is found in abundance. Co. seat, Leitchfield.

GRAYSON, a co. in n. Texas on Red and Trinity rivers, intersected by the Houston and Texas Central railroad; 950 sq.m.; pop. '80, 38,108—4,558 colored. It has an undulating surface in part covered with forests of ash, oak, etc. The soil is fertile; chief productions, corn, cotton, oats, cattle, and pork. Co. seat, Sherman.

GRAYSON, WILLIAM, b. Va.; d. 1790. He was educated at Oxford (Eng.) and in law in the temple in London. Migrating to Virginia, he became one of Washington's aids; subsequently commanded a Virginian regiment, and was on various commissions with regard to prisoners. He was in the Virginia convention to consider the federal constitution and (with Patrick Henry and others) vigorously opposed its adoption. He was one of the first U. S. senators from the state.

GRAYSON, a co in s.w. Virginia, on the North Carolina border; intersected by the Kanawha river; 400 sq.m.; pop. '70, 9,587—754 colored. The surface is hilly and about one-half is occupied by forests. The main productions are wheat, rye, corn, butter, wool, and cattle. Co. seat, Independence.

GRAY'S PEAK, one of the Rocky mountains in Colorado about 12 m. w. of Georgetown. Its height is 14,466 feet. It was named after prof. Asa Gray, the botanist. Not far away is Torrey's peak of almost the same height, named from prof. John Torrey, the botanist.

GREASE-WOOD, a plant growing profusely in the w. portion of the United States. Its botanical name is *sarcobatus vermiculatus*. It is most prolific on barren and alkaline soils.

GREAT BARRINGTON, a t. in Berkshire co., Mass., on the Housatonic river and railroad, 40 m. s.s.e. of Albany, N. Y., in the midst of a picturesque region; pop. '80, 4,658. There is water power, and a number of important manufactures. Beds of iron ore and marble are found in the township. Its schools are numerous and excellent. The new town hall is a fine building, before which is a fine statue of Victory for the soldiers' monument. In the vicinity is a curious rock formation called purgatory.

GREAT FALLS, a village partly in the town of Somersworth, in Strafford co., N. H., but reaching over into Maine, on the Portsmouth, Great Falls and Conway, and a branch of the Boston and Maine railroads, 5 m. n. of Dover; pop. estimated at 4,000. The cotton factories employ 3,000 persons, and use yearly 7,700 bales. There are also woolen and other manufactories, a town hall, high school, etc.

GREAT GRIMSBY. See GRIMSBY, GREAT, *ante*.

GREATOREX, ELIZA, b. Ireland, 1820, daughter of J. C. Pratt, a Wesleyan minister; wife of Henry W. Greatorex, son of the organist of Westminster abbey. She came to America in 1839. In 1854—56 she studied painting in New York, and in 1862 studied in Paris. In the interim she visited Ireland and England. About 1868 she began a series of sketches of historical edifices and scenes in and around New York. She was in Germany in 1870 and the following years, where she published *The Homes of Oberammergau*. Returning to the United States she published *Summer Etchings in Colorado*, and other works. Her latest work contains illustrations inland near New York.

GREAT PEDEE RIVER. Its sources are in the Alleghany mountains in n.w. North Carolina, whence it flows s.e., under the name of the Yadkin river, till its junction with the Rocky river in the s. part of the state; then, under the name of the Great Pedee, continues in a s.e. direction through South Carolina, receiving the affluents Little Pedee and Waccamaw, and empties into Winyaw bay. It is navigable for steamboats to Gardner's bluff, over 100 m. from its mouth, and for sloops 150 m., to the falls at Cheraw.

GREAVES, JOHN, 1602—52; b. England; educated at Oxford, and lecturer on geometrical science in a London college. He traveled in Europe and Egypt with a view of studying the pyramids, and in his journey collected many valuable manuscripts, gems, and coins. He was subsequently a prof. of astronomy at Oxford. Among his works were a *Discourse on the Roman Foot and Denarius*, a Persian grammar, and an unfinished dictionary of the same language.

GRECIAN GAMES. See GAMES, ANCIENT.

GREEK WINES. The mountain ranges of Greece offer many declivities; sloping towards the south, most favorable to viticulture; but its vineyards have for centuries been much neglected, and the production of wine in Greece, which was considerable at the time of the Venetian supremacy, has sunk to a relatively insignificant amount. The production of currants, however, is still a highly important branch of Greek agriculture. The principal vines cultivated in Greece are the *vitis corinthiaca* or *apyrena*, the

Greco, the *cipro*, the white and black *moscada*, the *malvasia*, the *sultana*, and the *assyrticon*. The vinification is very imperfect, and many wines contain so much acetic acid that they only last through the winter, and in summer turn into vinegar. To avoid this result the proprietors resort to smoking with wood smoke, or vapor of resins, which greatly injures their wine for foreign use. All provinces produce wine, but the best is that of Santorin, which is shipped largely to Russia. There is still a Malvoisie wine, though it is no longer that which was once so celebrated under the name of Malmsey; and the *Kephissia* wine of Attica and the red wine of Zante are in good repute. There has been a large increase in the number of vineyards since the kingdom began, and since 1858 a number of Greek wines have become of commercial importance. The best vineyards of Livadia are near Lepanto, Chaeronea, Megara, and on the slopes of mount Poligouna. Achaia, the northern part of the peninsula Morea, has extensive vineyards near Patras, Blattero, Voltizza, and Kalavrito. Near the latter town is the convent of Megaspileon, where the monks make and keep wines in large quantities. The best wine of the Morea is made near Pergos. The volcanic island Santorin, ancient Thera, produces from 9,000 to 11,000 pipes annually. The best red growth is called *Santorin*, and among the white wines, *Thera*, *Culliste* and *St. Elie* are the best known. Besides these, there is a muscadine wine, named *Vin Santo*, made of two colors. Among the islands of the Archipelago producing wines or raisins are: Skopelos, Skiatho, Skyro, Mykonos, Negropont, Andro, Tino, Thermia, Naxia, and Amorgo. A considerable quantity of wine is produced by the Turkish islands, Candia and Rhodes, and by Cyprus which is now governed by Great Britain.

GREELEY, a co. in e. Dakotah, formed after the census of 1870; 750 sq.m. It is very little settled. It is mostly prairie, and the soil is fertile.

GREELEY, a co. in w. Kansas on the Colorado border; organized after 1870; about 700 sq.m. It is level and with very little woodland.

GREELEY, a co. in central Nebraska formed after the census of 1870: on the Loup, a branch of the Platte river; 576 sq.m.; pop. '76, 194. It has a prairie surface, and the soil is fertile. Co. seat, Lamartine.

GREELEY, a t. in Weld co., Col., on Cache river, and the Denver and Pacific railroad, 52 m. n.e. of Denver; pop. about 2,000. It is in a valley of rare fertility, and enjoys a very pleasant climate. The schools of the town are of a superior order, and there are many important manufactories. It was founded in 1870 by a colony mainly from New York, and every care was taken to prepare for a large city in the future.

GREELEY, HORACE (*ante*), the eminent American journalist, never enjoyed the advantages of collegiate education, but he was an apt scholar and made the most of such opportunities for acquiring knowledge as were within his reach. His father was a poor, unprosperous farmer, and the boy, in his earliest years, was put to hard work. But he had an insatiable fondness for books, and every minute that he could spare from work or sleep was devoted to reading, and what he read he remembered. He neither shirked nor slighted any task, but did properly and well whatever the needs of the family required at his hands, the hope of finding time for reading acting as a constant stimulus to his fidelity. He made more of the scanty advantages of an ill-furnished country printing-office than some young men do of the opportunities afforded by a richly endowed college. The offer of "leading men in the neighborhood" to bear his expenses in a college course was doubtless declined by his parents not from any lack of appreciation of the advantages of such an education, but partly because they needed his services at home and partly on account of the pride which would not permit them to receive such a boon as an act of charity. However this may be, it is to be lamented that a man so richly endowed by nature did not receive the best education the country could furnish. His early interest in political, industrial, and social questions was fortunate, for it was this that led him to qualify himself for a career of eminent usefulness. He brought to the discussion of such topics not the ambition of an office-seeker or the arts of the demagogue, but a strong desire and purpose to secure the highest welfare of the whole people. If he was not always right on current questions, nor always free from the impetuosity which too often mars the efforts of reformers, he discussed those questions with a vigor and intelligence not often exhibited by the conductors of political journals in his day. A high moral purpose was at the bottom of every form of political and social activity to which he lent his support. He was a partisan, with many of the faults which must ever spring from that bitter root, but few men have ever enjoyed in a higher degree than himself the respect and confidence of his political opponents. When he came to New York in 1831, a boy of 20 years, poorly clad, with only \$10 in his pocket, his aspirations were of the noblest sort, his character unsullied, his mind well informed upon many subjects of the highest interest. Every step from the obscurity of that period to the eminence he afterwards attained was perfectly natural. The *Morning Post*, the first penny daily ever published, was marked by that genius for editorship which he possessed in so high a degree. It failed not for lack of intellectual strength. The *New Yorker*, which lived for seven years and was finally merged in the *Weekly Tribune*, was confessedly the best literary newspaper in America at that period. The *Log Cabin* showed for the first time how a campaign paper may be made

a vehicle of instruction as well as a means of political excitement. These all, naturally enough, prepared the way for *The Tribune*, which was founded in 1841, and which is the noblest monument to his fame. In his *Recollections of a Busy Life* he says: "Fame is a vapor; popularity an accident; riches take wings; the only earthly certainty is oblivion; no man can foresee what a day may bring forth, while those who cheer to-day will often curse to-morrow: and yet I cherish the hope that the journal I projected and established will live and flourish long after I shall have molded into forgotten dust, being guided by a higher wisdom, a more unerring sagacity to discern the right, though not by a more unfaltering readiness to embrace and defend it at whatever personal cost; and that the stone which covers my ashes may bear to future eyes the still intelligible inscription, Founder of the *New York Tribune*." In 1848 he was elected to congress to fill a vacancy, serving from Dec. 1 of that year to March 4, 1849. He distinguished himself by an uncompromising but unpopular war against the abuses of the mileage system, thereby incurring the bitter hostility of not a few of his own party. In this as in many other instances he was careless of his own popularity and bent only upon promoting the public welfare. He was warmly interested in every movement which seemed to him likely to improve the condition and enlarge the opportunities of the toiling poor, and his paper was ever open to the consideration of such themes. When the North American Phalanx was organized, in 1843, near Red Bank, N. J., in part upon the principles of Charles Fourier, the French socialistic reformer, he gave it such aid as lay in his power. He opened the columns of *The Tribune*, to a limited extent, to an exposition and defense of Fourier's general plan, though dissenting very earnestly from some of his doctrines. He was intolerant of every assault upon the institution of the family, prompt to denounce every sentiment and practice inconsistent with the highest standard of social purity. He was quick to discern and point out the evils and abuses of existing institutions, but he was neither a revolutionist nor an iconoclast. He recognized the law of growth and development in human society, and, having done what he could to diffuse right principles, awaited the result with a cheerful confidence in the Providence that watches over human affairs. He lectured much in different parts of the country, generally upon topics of social and political reform; and, though utterly destitute of the qualities of an orator, the respect entertained for his character and opinions was always sure to command for him a wide and favorable hearing. Agricultural and manufacturing industries engaged much of his attention, and few men in his day did more than he to promote their development. He served as one of the American jurymen at the great London exposition of 1851, and before returning home traveled through France, Italy, and Great Britain. In 1855 he went to Europe for the second time, spending six weeks in Paris, where he was imprisoned for two days, being prosecuted by a French sculptor, to recover compensation for damages done to a statue in the New York world's fair of 1853, of which he was a director. He was liberated in the regular course of judicial proceedings. If he had depended for his freedom upon the clemency of the emperor, his imprisonment would in all probability have been prolonged; for that monarch could hardly have been expected either to forget or forgive the American editor who had so conspicuously and persistently denounced as an indescribable infamy the *coup d'état* of 1851. Though not in the technical sense of the word an abolitionist, Mr. Greeley was an opponent of slavery, and foremost among those who sought to resist its extension to the territory acquired from Mexico. From 1850 to the end of the conflict, *The Tribune*, under his direction, did much to inform and invigorate the anti-slavery sentiment of the northern people, and to prepare them for the great struggle that ensued. When, after the election of Lincoln in 1860, the south threatened to secede from the union, he frankly declared that if a majority of the people of any state, after full and free discussion, should sincerely and deliberately vote to withdraw, he was willing they should do so. But he held that the votes actually taken at the south did not express the real convictions of the majority, but were the result of terrorism and panic; and when the rebellion broke out, he lent his voice and influence to the support of the government in its efforts to suppress it by force. He had a keen sense of the horrors of a civil war, and was willing to adopt any reasonable and rational plan to avert them. His belief was that if any of the states should deliberately decide to secede, they would soon come to their senses and return to the union, and that this would be better than war. But when nearly the whole south gave itself up to the frenzy of secession and rebellion, he saw at once that the north had no other honorable alternative than a prompt and forceful resistance. The war once begun, he was in favor of its vigorous prosecution, and impatient with what seemed to him unreasonable slowness on the part of the government. At times he was much discouraged, and disposed to think that, to avoid worse calamities, the war should be ended by some compromise short of the result most to be desired. It was this feeling that made him willing to go to Canada, in 1864, with the unofficial sanction of Lincoln, to hold a fruitless conference with George N. Sanders, Jacob Thompson, and Beverly Tucker, the confederate agents on the subject of peace. At the close of the war he advocated the doctrine of universal amnesty and universal suffrage. In other words, he held that there should be no civil penalties inflicted upon those who had taken part in the rebellion, and that negroes should be admitted to vote on equal terms with the whites. He held that the prolonged imprisonment of Jefferson Davis, without indictment or trial

for any offense, was a palpable infraction of the sixth amendment of the constitution, which declares that "in all criminal prosecutions the accused shall enjoy the right to a speedy and public trial by an impartial jury of the state and district wherein the crime shall have been committed;" that the government was bound either to try or release him at once; and that to make a martyr of him by an imprisonment not warranted by law was a gratuitous aggravation of the obstacles to reconstruction, and a stigma upon the character of the republic. He therefore joined with Gerrit Smith and others in signing the bail-bond of Mr. Davis, whereby he and they became responsible to the government for his appearance to answer any indictment that might be found against him. This act, in the then state of public sentiment at the north, brought upon him much odium, but he was always proud of it as right in itself and calculated to promote the best interests of the country. It certainly was an act which demanded a high degree of moral courage for its performance. In 1861, not by any agency of his own, but doubtless with his own consent, he was a candidate for the republican nomination for U. S. senator, but was defeated by Ira Harris. In 1864 he served as a presidential elector, voting for the re-election of Lincoln. In 1869 he was the republican candidate for comptroller of the state of New York, but was defeated, the democrats being then in power in the state. In 1870 he was a candidate for congress in the 6th New York district, but without any chance of success, the district being overwhelmingly democratic. He ran 300 votes ahead of the republican state ticket. It is said by men who shared his confidence, that while he was too proud to be an applicant for any office or to take any step to secure a nomination, he yet very keenly felt the neglect of others to recognize his honorable claims for promotion upon the parties he served so faithfully and well. This view of his character finds striking confirmation in a private letter addressed by him, Nov. 11, 1854, to gov. Seward. When, in 1860, Mr. Seward, largely no doubt through Mr. Greeley's influence, failed of a nomination for the presidency, he permitted his friends to make public allusions to the contents of this letter as affording evidence that Mr. Greeley's opposition to himself was of a selfish and personal character. Mr. Greeley thereupon demanded the publication of the letter, in which, under the seal of privacy, he reminded gov. Seward of what he had done for the whig cause in 1838, and then said: "I was a poor young printer. . . . I did the work required to the best of my ability, and I did it well. When it was done, you were governor, dispensing offices worth \$3,000 to \$20,000 per year to your friends and compatriots. I returned to my garret and my crust, and my desperate battle with the pecuniary obligations heaped upon me by bad partners in business and the disastrous events of 1837. I believe it did not then occur to me that some one of those abundant places might have been offered to me without injustice; I now think it should have occurred to you." And then he referred to his services for the party in the Harrison campaign of 1840, which had been requited after the same fashion. After the election was over, he says, "came the great scramble of the swell mob of corn minstrels and cider-suckers at Washington, I not being counted in. . . . I asked nothing, expected nothing; but you, governor Seward, ought to have asked that I be postmaster of New York." It was for reasons such as these that he notified gov. Seward of "the dissolution of the political firm of Seward, Weed, and Greeley, by the withdrawal of the junior partner," and the breach thus made was never healed. In 1872 Mr. Greeley was opposed to the renomination of gen. Grant for a second term, and co-operated with a body of "liberal republicans," who held a convention in Cincinnati, on the 1st of May, in advance of the regular republican convention, to nominate another candidate. On the 6th ballot the nomination fell to Mr. Greeley, and was by him accepted. The platform of the "liberal republicans" affirmed in their entirety and in vigorous terms the cardinal principles of the republican party itself. It recognized the equality before the law of all men, of whatever nativity, race, color, or persuasion; it pledged its supporters to maintain the union, emancipation, and enfranchisement, and to oppose any re-opening of the questions settled by the latest amendment to the constitution; it demanded the immediate and absolute removal of all disabilities imposed on account of the rebellion, in the belief that universal amnesty would result in the complete pacification of all sections of the country; it declared that local self-government, with impartial suffrage, would guard the rights of all citizens more securely than any centralized power; it declared that the public welfare required the supremacy of the civil over the military authority; freedom of persons under the protection of habeas corpus, and a return to the methods of peace and the constitutional limitations of power; it demanded a thorough reform of the civil service, which had become a scandal and reproach upon free institutions, and a source of demoralization dangerous to the perpetuity of republican government; and, finally, it declared that the public credit must be sacredly maintained, denounced repudiation in every form and guise, and demanded a speedy return to specie payment, as demanded alike by the highest considerations of commercial morality and honest government. Upon this basis the convention invited the co-operation of all patriotic citizens without regard to previous affiliations. Whatever may be the judgment of posterity as to the wisdom of Mr. Greeley in allowing himself under the circumstances to be made a candidate for president upon such a platform, it is only just to say that he understood himself to have reaffirmed the very principles for which he had contended as a republican, and to have neither made nor proposed any concession whatever to those who had

opposed and resisted them. When the democratic party adopted that platform in its entirety and without qualification, and nominated him as their candidate for president, he accepted their action as the sign and pledge of a new departure, and believed that if he should be elected there would be an end of all political schemes having their root in the spirit of slavery and calculated to array the south against the north. Whether he was or was not deluded in this regard, there is no reason to doubt his entire sincerity and good faith in the course he pursued. Nor is there any reason to wonder that he was deeply wounded, disappointed, and mortified in finding himself accused by many of his old friends of having thrown away his principles and entered into a foul conspiracy to turn over the government of the country to the control of the men who had instigated the rebellion. It may be said that this accusation was alike natural and plausible, and that it was a weakness on his part not to have anticipated it; and perhaps this is all true. But those who stood near him in that conflict affirm that it was not his defeat as a presidential candidate, but the cruel impeachment of his integrity by old friends, that wounded his spirit past all healing. The popular vote cast for him amounted to 2,834,079, against 3,597,070 for gen. Grant; but the only states carried by him were Georgia, Kentucky, Maryland, Missouri, Tennessee, and Texas.

He had overtasked his powers for many years. Near the close of the campaign he was required to watch at the bedside of his dying wife. During the whole contest his powers of endurance were strained to the utmost, and when it was at last over, he was prostrated by a disorder of the brain and sank rapidly into the arms of death. The sad event made a very profound impression upon the country, and showed how deeply he was admired and loved by good men of all parties and every variety of opinion. His body lay in state in the city hall for one day, where it was visited by a vast multitude of people, many of whom lingered for hours in the slow-moving procession for an opportunity to look upon his dead face. His funeral was simple but very impressive, and was attended by the president and vice-president of the United States, and many other persons of distinction. He died as he had lived, in the faith of Universalism. His published volumes are as follows: *Hints Toward Reforms* (1850); *Glances at Europe* (1851); *History of the Struggle for Slavery Extension* (1856); *Overland Journey to San Francisco* (1860); *The American Conflict* (2 vols., 1864-66); *Recollections of a Busy Life* (1868); *Essays Designed to Elucidate the Science of Political Economy* (1870); and *What I Know of Farming* (1871). His life was written by James Parton in 1855, and a new edition appeared in 1868.

GREEN, a co. in s. central Kentucky on Green river; 525 sq.m.; pop. '70, 9,379—1937 colored. It has a hilly surface, and is largely covered with forests. The main productions are tobacco, wheat, corn, oats, and butter. Co. seat, Greensburg.

GREEN, a co. in s. Wisconsin, on the Illinois border, drained by Sugar and Pecatonica rivers, and reached by a branch of the Milwaukee and St. Paul railroad; 576 sq.m.; pop. '70, 23,611. The surface is diversified with hills and prairies, and timber is plenty. The main productions are wheat, corn, oats, hay, butter, and pork. Co. seat, Monroe.

GREEN, ASHBEL, D.D., LL.D., 1762-1848; b. N. J.; educated in the college of New Jersey. He was tutor and professor of mathematics and natural philosophy at Princeton; Presbyterian pastor in Philadelphia; member of the general assembly; chaplain to congress, and one of the founders of the first Bible society in the country—in Philadelphia. From 1812 to 1822 he presided over the college of New Jersey, and for 12 years afterwards was editor of the *Christian Advocate*. He and others originated the now famous theological seminary in connection with the college at Princeton. Besides these he filled several other important offices, and had great influence in the affairs of his denomination. He published a history of Princeton college, and a few lectures.

GREEN, BARTHOLOMEW, 1666-1732; b. Mass.; the first printer of a regular newspaper in North America (see AMERICAN JOURNALISM). In 1704 he started a small weekly, the *Boston News-Letter*, which he continued as long as he lived.

GREEN, DEFF, d. 1875; long known in Washington as the editor of democratic newspapers. He was a warm supporter of president Jackson, and so extreme in his methods of expression that he became involved in a number of duels, one of which was with James Watson Webb, editor of the *New York Courier and Enquirer*. None of Green's duels had any very serious results.

GREEN, HENRY WOODHULL, LL.D., b. N. J., 1804; graduated at Princeton, and soon became an eminent lawyer. In 1846 he was made chief justice of the state supreme court, and in 1850 chancellor. In 1867 he was on a commission for revision of the tax laws. He was at one time president of the board of trustees of Princeton theological seminary.

GREEN, HORACE, LL.D., 1802-66; b. Vt., and educated at Middlebury college; studied medicine and practiced in his state; finally settled in New York, and completed his medical studies in Paris. He was professor in a medical college at Castleton, Vt. In 1850 he was one of the founders of the New York medical college, became one of the faculty, and was professor of the theory and practice of medicine. He published a number of works chiefly on diseases of the air passages and lungs, and *Selections from the Favorite Prescriptions of Living American Physicians*.

GREEN, JACOB, 1722-90; b. Mass.; educated at Harvard and Princeton, and in 1745 licensed to preach by the New York presbytery. In 1757 he was vice-president of Princeton college. In 1775 he was a member of the provincial congress, and chairman of the committee that drew up the constitution of R. I. Among his works are *A View of the Constitution of the Jewish Church*, and *A View of a Christian Church and Church Government*. His autobiography was published by his son.

GREEN, SAMUEL, 1615-1702; b. England; one of the first printers in the English American colonies, succeeding Stephen Day at Cambridge, Mass., in 1648. He printed the Bible, the colonial laws, Baxter's *Call*, and several other works in the Indian language for John Eliot, the missionary.

GREEN, SETH, b. New York, 1817; especially noted for his efforts in fish culture. He entertained the idea of cultivating or breeding the better kinds of fish to stock lakes and streams then barren. After many experiments he succeeded in hatching enormous numbers from the spawn of shad, trout, and other kinds, with which he stocked the Connecticut, the Hudson, the Potomac, the Susquehanna, and a great number of less important streams. His work became so popular that state associations were formed to further his purpose, and honors from France and other countries were awarded to the originator. He has published one or more works on the subject of fish culture. For several years he has been commissioner of fisheries of the state of New York.

GREEN, WILLIAM HENRY, D.D., LL.D., b. N. J., 1825; graduated at Lafayette college, Penn., and studied at Princeton theological seminary, where he was teacher of Hebrew. In 1848 he became a Presbyterian minister, and pastor of the Central church in Philadelphia the next year. In 1851 he became professor of Hebrew and Old Testament literature in Princeton theological seminary. In 1868 he was elected president of the college of New Jersey, but declined the office. He is one of the committee on the new English translation of the Bible. His publications are *Hebrew Grammar*; *Hebrew Chrestomathy*; *The Pentateuch Vindicated*; and *The Argument of the Book of Job Unfolded*.

GREEN, WILLIAM MERCER, D.D., LL.D., b. N. C., 1798; graduated at the state university, and was ordained in the ministry in 1820. In 1849 he was chosen bishop of Mississippi (Prot. Epis.). He was one of the promoters and founders of the university of the south at Suwanee, Tenn., and chancellor thereof. His main work is *Sermons on Apostolic Succession and Baptismal Regeneration*.

GREEN BAY, a branch of lake Michigan running s.s.w. into Wisconsin nearly 100 m. having a breadth of 10 to 20 miles. The largest stream falling into the bay is Fox river at the extreme s. end.

GREEN BAY, a city in Brown co., Wis., on Fox river and Green bay, on the Chicago and Northwestern, the Wisconsin Central, and the Green Bay and Minnesota railroads; pop. '75, 8,037. There is a good harbor, a bridge over the river, a court house, a high school, a Roman Catholic academy and convent, and residence of a bishop of that church; many iron works, mills, and factories. Lumber is one of the great articles of trade, and the grain traffic is also large. The French settled here in 1745; the city was incorporated in 1854.

GREENBRIER, a co. in s.e. West Virginia, on Meadow and Greenbrier rivers, and the Chesapeake and Ohio railroad, n.w. of the Alleghany mountains; 880 sq.m.; pop. '70, 11,417—1103 colored. The surface is rough with good timber. Corn, wheat, oats, and hay, are the main products. White Sulphur Springs in this co. is a favorite resort in the summer season. The co. is crossed by Greenbrier river, the chief tributary of the Great Kanawha, and by sections of the Greenbrier mountains. Co. seat, Louisburg.

GREENBUSH, or EAST ALBANY, a village in Rensselaer co., N. Y., on the Hudson river opposite Albany, to which city there is the bridge of the New York Central railroad; pop. of township '75, 7,066. The Boston and Albany, and the Troy and Greenbush railroads terminate here. The main business is with railroad affairs, such as freight depots, machine shops, etc. There are some other manufactories.

GREENCASTLE, a city in Putman co., Ind., on the Louisville, New Albany and Chicago railroad, at the junction of St. Louis and Terre Haute, and Indianapolis roads, 33 m. w. of Indianapolis; pop. (with township) '70, 3,227. There are some important manufactories in the village, and it is the seat of the Indiana Asbury university (Meth. Epis.), the Indiana female college, and a Presbyterian educational institute. There are manufactures of iron, pumps, machinery, etc.

GREENE, a co. in n.w. Alabama between the Tombigbee and black Warrior rivers, crossed by the Alabama and Chattanooga railroad; 750 sq.m.; pop. '70, 18,399—14,541 colored. The surface is generally level, with a large proportion of woodland; soil fertile, and chief productions corn and cotton. Co. seat, Eutaw.

GREENE, a co. in n.e. Arkansas on the border of Missouri, between the Cache and St. Francis rivers; reached by the Cairo and Fulton railroad; 950 sq.m.; pop. '70, 7,573—156 colored. The surface is low and level, producing corn and cotton. Co. seat, Gainesville.

GREENE, a co. in n. Georgia on the Appalachee and Oconee rivers, crossed by the Georgia railroad; 374 sq.m.; pop. '80, 17,547—11,969 colored. The surface is hilly, and

the soil is much worn from long cultivation. The main products are cotton and corn. Co. seat, Greensborough.

GREENE, a co. in w. Illinois, e. of Illinois river, intersected by the St. Louis, Rock Island and Chicago, and the Chicago and Alton railroads; 500 sq.m.; pop. '80, 23,014. The surface is varied, and in some parts hilly, with forests of oak, hickory, and other valuable trees. Corn, wheat, and pork are the principal products. There are good beds of soft coal, and fine limestone for building. Co. seat, Carrollton.

GREENE, a co. in s.w. Indiana on the w. fork of White river, crossed by the Indiana and Vincennes, and the Bedford, Springfield, Owensburg and Bloomfield railroads; 540 sq.m.; pop. '70, 19,514. The surface is generally level and covered to a large extent with forests. The soil is fertile, producing wheat, corn, oats, etc. There are some coal mines. Co. seat, Bloomfield.

GREENE, a co. in w. central Iowa on Raccoon river, crossed by the Chicago and Northwestern, and the Des Moines and Ft. Dodge railroads; 576 sq.m.; pop. '75, 7,028. It has a prairie surface, partially covered with forests, and a fertile soil. Chief productions corn; wheat, oats, and hay. Co. seat, Jefferson.

GREENE, a co. in s.e. Mississippi, on the Alabama border, drained by the Leaf and Chicasaw rivers; 825 sq.m.; pop. '70, 2,038—372 colored. The surface is for the most part covered with forests, and the soil is poor. Co. seat, Leakesville.

GREENE, a co. in s.w. Missouri on James and Sac rivers, crossed by the St. Louis and San Francisco railroad; 660 sq.m.; pop. '70, 21,549—2,156 colored. It has an undulating and hilly surface, to a considerable extent covered with forests. The soil is good, producing corn, oats, wheat, etc. Co. seat, Springfield.

GREENE, a co. in e. New York on the n. side of the Hudson river, drained by the Schoharie and Catskill creeks; area 600 sq.m.; partially crossed by a branch of the New York Central railroad; pop. '75, 31,833; in '80, 34,625. The surface is tolerably level near the river, but further w. rises into the Catskill range of mountains, some of which are 2,000 to 3,000 ft. above tide. (See CATSKILL MOUNTAINS.) Some cereals are raised, but the land is better adapted to pasturage. Geologically the rocks in this co. are especially interesting. Co. seat, Catskill.

GREENE, a co. in e. central North Carolina, drained by stream running into Neuse river; 300 sq.m.; pop. '70, 8,687—4,521 colored. It has a level surface partially covered with forests, and the soil is in some parts fertile. Corn and pork are the chief productions. Co. seat, Snow Hill.

GREENE, a co. in s.w. Ohio on Little Miami and Mad river, crossed by the Pittsburgh, Cincinnati and St. Louis railroad; 430 sq.m.; pop. '70, 28,038. The surface is undulating or hilly, and forests are abundant. The soil is good; chief productions, corn, wheat, oats, and pork. Co. seat, Xenia.

GREENE, a co. in s.w. Pennsylvania on the West Virginia border, w. of the Monongahela river and drained by the Wheeling and Ten Mile creeks; 620 sq.m.; pop. '70, 25,887. It has a rough and hilly surface with considerable forests. The soil is good; corn, wheat, hay, oats, and pork are the staple products. Co. seat, Waynesburg.

GREENE, a co. in e. Tennessee on the North Carolina border, drained by affluents of French Broad river, and crossed by the East Tennessee, Virginia and Georgia railroad; 750 sq.m.; pop. '70, 21,688—2,064 colored. The surface is in part mountainous but the valleys are fertile, producing corn, wheat, oats, etc. There are iron mines, and beds of limestone. Co. seat, Greenville.

GREENE, a co. in n. central Virginia between the Blue Ridge and the Rapidan river; 220 sq.m.; pop. '70, 4,634—1,452 colored. Surface is rough, with fertile valleys; chief products, corn, wheat, and oats. Co. seat, Stanardsville.

GREENE, CHARLES GORDON, b. N. H. 1804; apprentice to his brother Nathaniel. In 1825 he published at Taunton, Mass., the *Free Press*; in 1826, the *Boston Spectator*; then returned to the *Boston Statesman*; in 1828, was one of the editors of Duff Green's paper, the *Telegraph of Washington*; succeeded his brother as editor of the *Boston Statesman*; and in 1831 began the *Boston Post*, a strongly democratic daily and weekly, which he edited until his death.

GREENE, CHRISTOPHER, 1737-81; b. R. I.; an officer in the revolutionary army rising to lieutenant-col. He went with Arnold through the wilderness and was taken prisoner at Quebec, but was soon exchanged. He defended Fort Mercer (at Red Bank on the Delaware) Oct. 22, 1777, against the Hessians who were repulsed and their commander killed. In May, 1781, he was surprised in his quarters on Croton river by a force of refugees and killed.

GREENE, GEORGE WASHINGTON, b. R. I., 1811; studied at Brown university, and resided for some time in Europe. In 1837-45 he was U. S. consul at Rome, and in 1872 he was made professor (non-resident) of American history in Cornell university. His principal works are *Ancient Geography*; *History and Geography of the Middle Ages*; *Life of Gen. Nathaniel Greene* (his grandfather); *Historical View of the American Revolution*; and *Biographical Studies*.

GREENE, NATHANIEL, b. N. H., 1797; was apprentice in the office of the *New Hampshire Patriot*, and at the age of 17 edited the *New Hampshire Gazette*; afterwards the *Gazette* at Haverhill, Mass., and the *Essex Patriot*. In 1821 he started the *Boston Statesman*, a prominent democratic organ. He has published *Tales and Sketches from the German and French*, and *Improvisations and Translations*.

GREENE, S. DANA, b. Md., 1840; graduated at the U. S. naval academy, and rose to the rank of commander in 1872. In the battle between the *Monitor* and the confederate iron-clad *Merrimack* he succeeded to the command when capt. Worden was wounded, and drove the *Merrimack* into Norfolk harbor.

GREENFIELD, a t. in Franklin co., Mass., near the Connecticut river, about 2 m. above the junction of the Deerfield, on the Connecticut river, and the Vermont and Massachusetts railroads; pop. '80 (with township), 3,903. The Green and Fall rivers afford ample water-power, and there are several important manufactories, particularly of fine cutlery. In the village are a court-house, several churches, and many excellent schools.

GREEN ISLAND, a village in Albany co., N. Y., on an island in the Hudson opposite Troy; pop. about 5,000. It connects with both shores by bridges, and has important manufactories for railway cars and machinery, foundries, and a large trade in lumber.

GREEN LAKE, a co. in central Wisconsin, on Fox, Grand, and White rivers, reached by the Milwaukee and St. Paul, and the Sheboygan and Fond-du-Lac railroads; 370 sq. m.; pop. '75, 15,274. The surface is undulating and to a large extent covered with forests. Wheat, corn, oats, hay, and butter are the chief products. Co. seat, Dathford.

GREENLEAF, BENJAMIN, 1786-1864; b. Mass.; graduated at Dartmouth, and became principal of Bradford academy and of the teachers' seminary at the same place. He was a member of the legislature in 1837-9. He is best known through his text books on arithmetic, algebra, and surveying.

GREENLEAF, SIMON, LL.D., 1783-1853; b. Mass.; hon. A.M., Bowdoin coll.; admitted to the bar in 1806, and became distinguished as an advocate and jurist. When Maine was separated from Massachusetts he was made reporter of the supreme court of the new state, and 9 vols. of his reports were published. In 1833 he became professor of law in Harvard, and resigned in 1848. Among his works are *Origin and Principles of Freemasonry*; *Examination of the Testimony of the Four Evangelists by the Rules of Evidence as Administered in Courts of Justice, with an Account of the Trial of Jesus*; *Treatise on the Law of Evidence*; and *Overruled, Denied, and Doubted Decisions and Dicta*.

GREEN MOUNTAINS (*ante*), the n. extension of the great Appalachian system, covering a large portion of Vermont. Reaching the state near the s.w. corner they form almost an unbroken line through the w. section in the direction e.n.e. They form a continuous water-shed, streams from the w. slope going into lake Champlain and those from the e. side into Connecticut river. The Lamoille, Missisquoi, and Winooski rivers make their way through the range and reach the lake. The more important of the peaks and their height above tide are: Mansfield, 4,279 ft.; Camel's Hump, 4,188; Killington, 3,984; and Ascutey, 3,320. The ascent of Killington peak is not difficult, and from the top there is a magnificent view. The mountain is 9 m. from Rutland.

GREENOUGH, HORATIO, 1805-52; b. Boston; a self-taught sculptor, befriended by Washington Allston. He was in Italy in 1825; returned in 1826, made some creditable work, and again went to Italy, fixing upon Florence as his abode. Here he worked with great assiduity, producing a vast number of pieces, of which a few are a statue of "Abel;" Byron's "Medora;" "Genius of America;" a statue of "Washington;" the "Angel Abdiel;" the "Graces;" "Savior Crucified;" and busts of John and John Quincy Adams, Henry Clay, Josiah Quincy, Samuel Appleton, Jonathan Mason, Thomas Cole, John Jacob Astor, John Marshall, and others. The large group of "The Rescue" in the capitol took eight years of his time. It had been brought by him from Italy, and he was preparing to set it in its place, when he died suddenly of brain fever. He was the author of several essays on esthetics, and was perhaps more eminent as a critic of art than as an artist. His work has doubtless been surpassed by that of later sculptors, but he may fairly be called the father of American sculpture.

GREENOUGH, RICHARD S., brother of Horatio, and also a sculptor, b. Mass., 1819. He had the advantage of study under Clevinger, and in 1840-41, was among the artists and galleries of Europe. Some of his works are a "Head of Christ;" "Moses and Pharaoh's Daughter;" "Night Watching a Young Mother;" "Cupid Warming an Icicle;" "The Shepherd Boy and the Eagle;" "Victory;" with various busts and ideal heads.

GREENPOINT. See BROOKLYN.

GREENPORT, a t. in Suffolk co., N. Y., on the n. shore and near the e. end of Long Island, at the terminus of the Long Island railroad, 95 m. e.n.e. of New York. It is a port of entry and was once the starting point of an important whale-fishing busi-

ness. There is still considerable local business and trade by sea. The town and neighborhood are much frequented by summer pleasure-seekers.

GREEN RIVER, the name of two considerable streams in Massachusetts; one comes from Windham co., Vt., and falls into Deerfield river at Greenfield. The other, starting from the boundaries of Massachusetts and New York, runs s. through West Stockbridge, Alford, Great Barrington, etc., to the Housatonic. Both streams afford valuable water-power.

GREEN RIVER, rising in Wyoming, flows s. through about two thirds of Utah; unites with Grand river and forms the great Colorado. The Green is 750 to 800 m. long, and runs through many deep gorges and cañons in a mountainous region, and is for the most part too rough or shallow for navigation.

GREENSBORO, the seat of justice of Hale co., Ala., on the Selma, Marion, and Memphis railroad, 5 m. n.w. of Selma; pop. '70, 1760. The village is the seat of the Southern university of the M. E. church (founded in 1859), and has a female seminary and other schools.

GREENSBURG, the seat of justice of Decatur co., Ind., on the Indianapolis, Cincinnati, and Lafayette railroad, 68 m. w.n.w. of Cincinnati; population estimated at 3,700. The place has a considerable number of manufactories, a court-house, and high school.

GREEN SNAKE, a serpent common through most of the United States, especially in grassy places; long, slender, and entirely harmless.

GREENUP, a co. in n.e. Kentucky, on the Ohio river, crossed by the Eastern Kentucky railroad; 480 sq.m.; pop. '70, 11,463—461 colored. The surface is hilly. Chief productions, corn, wheat, and oats. Co. seat, Greenup.

GREENVILLE, a co. in n. South Carolina, on the North Carolina border, n.e. of Saluda river, intersected by the Atlantic and Richmond railroad; 800 sq.m.; pop. '80, 37,494—14,511 colored. The surface is diversified by mountains, hills, and valleys, and much of it is yet forest land. Wheat, corn, and pork are the main products. Co. seat, Greenville Court House.

GREENVILLE, a co. in s.e. Virginia on the North Carolina border s. of Nottaway river; crossed by the Petersburg and Weldon railroad; 300 sq.m.; pop. '70, 6,362—4,207 colored. The surface is level and largely covered with forests. Corn, oats, and tobacco are the main products. Co. seat, Hicksford.

GREENVILLE, the seat of justice of Butler co., Ala., on the Mobile and Montgomery railroad, 3½ m. n.n.e. of Mobile; pop. '70, 2,856. The village has a court-house, several churches, and some manufactures.

GREENVILLE, the seat of justice of Darke co., Ohio, on the Dayton and Union railroad at the junction of the Columbus, Chicago and Indiana Central, 94 m. w. of Columbus; pop. 2,520.

GREENVILLE, or **GREENVILLE COURT-HOUSE**, the seat of justice of Greenville co., S. C., on the Atlanta and Richmond, at the terminus of the Greenville and Columbia railroad; pop. '80, 6,159. It is pleasantly situated, and is the seat of the southern Baptist theological seminary, and of the Farman university, also Baptist. There are some manufactories.

GREENWICH, a t. in Fairfield co., Conn., on Long Island sound, and the New York and New Haven railroad, 30 m. n.e. of New York, near the boundary of New York state. It is a handsome village and a favorite place of residence for business men of the metropolis. The place was settled about 1640, and ten years later was agreed upon by a Dutch and English commission as the w. boundary of Connecticut. The present village is on a rolling hill half a mile from the railway station. A short walk to the e. brings one to a stately Congregational church built of gray marble with high pointed roof and a fine stone spire visible for many miles along the sound. A few yards to the e., where a church stood in 1779, gen. Putnam with 60 raw militiamen fought to the last moment a large force of English dragoons, and then galloped his horse down a declivity where no enemy dared to follow. Most of his men escaped by hiding in a swamp. Pop. '80, 7,892.

GREENWOOD, a co. in s.e. Kansas, on the headwaters of Verdigris river; 1155 sq.m.; pop. '70, 3,484. The surface is generally level; productions agricultural. Co. seat, Eureka.

GREENWOOD, FRANCIS WILLIAM PITT, 1797—1843; b. Boston, graduated at Harvard, studied theology, and became prominent among those known as liberal Christians. For a year he was pastor of the new South church, Boston, but resigned in consequence of poor health. He was afterwards pastor of King's chapel. Among his literary labors were editing the *Unitarian Miscellany*, revising the *Book of Common Prayer*, *Sermons of Consolation*, *History of King's Chapel*, *Lives of the Twelve Apostles*, *Sermons to Children*, and many smaller publications.

GREENWOOD CEMETERY. See CEMETERIES.

GREER, a co. in the n.w. corner of Texas, according to the state claim, lying between the forks of the Red river; but considered by U. S. surveyors as lying within the Indian territory; area 3,480 sq. miles. It contains good land, but little timber. It is unsettled, and as yet unorganized.

GREG, WILLIAM RATHBONE, b. England 1809. In 1856 he was commissioner of customs. He has published *Essays on Political and Social Science; Enigmas of Life; Literary and Social Judgments; Political Problems; Creeds of Christendom; Rocks Ahead, or the Warnings of Cassandra; Mistaken Aims and Attainments of the Artisan Class*, and many short papers in the British journals. He is a trenchant writer, with a strong skeptical habit of thought.

GREGARINES (GREGARINIDÆ *ante*), animals which form the principal genus (*Gregarina*), of the family gregarinidæ of that branch of the animal kingdom called *protozoa*. The principal form is an oval sac without mouth or intestines, but filled with a granular matter. They are sometimes of considerable length, said to be owing to linear aggregation for purposes of reproduction. Whatever fructification is the result of this intercourse is cast forth by the bursting of the cell in the form of vesicles called pseudo-navicula, which, by the process of alternate generation, produce pseudo-amœbæ, these latter passing on into the condition of developed gregarines, to pass again through the different stages of the simple metamorphosis. One of the largest inhabits the intestines of the lobster, and is called *G. gigantea*, being nearly two-thirds of an inch long and nearly as wide. The gregarina infest the intestines of various articulates, as the lobster, crab, cockroach and various beetles. A small insect which infests the false hair which fashion often prescribes as a part of the head dress of women, has also been called a gregarine.

GREGG, a co. in n.e. Texas, on Sabine river, and the Texas and Pacific railroad; formed after the census of 1870. The surface is varied; chief productions corn and cotton. Co. seat, Longview.

GREGG, DAVID McM., b. Penn., 1833; graduated at West Point, and served chiefly on the western borders. In the war of the rebellion he served on the union side, and was in a number of engagements. He resigned two months before the close of the war, holding the rank of brevet maj.gen. of volunteers.

GREGG, JOHN I., b. Penn., went into the army and served in the Mexican war. He served also in the war of the rebellion, and was engaged at Gettysburg, Cold Harbor, and other places. For good conduct he was made brevet brig.gen. in the regular army, and in 1866 was appointed col. of the 8th cavalry.

GREGORAS, NICEPHORAS, b. about 1295; a priest in Constantinople, who proposed a reformation in the calendar in a plan which came very near exactness. He was a theological controversialist, and was much involved in the disputes between the eastern and western branches of the church, and was in trouble about the teachings of Barlaam. He wrote a Byzantine history.

GREGOROVIVS, FERDINAND, b. Prussia 1821; educated at Königsberg, and devoted himself to poetry and history. He has published a learned review of Goethe's *Wilhelm Meister; Death of Tiberius* (a tragedy), etc. After sojourning in Italy he published *Corsica; Life and Scenery in Italy; The Latin Summer, and Sicily*. His more important works are *History of Rome in the Middle Ages*, and *History of Lucretia Borgia*.

GREGORY, a co. in n. Dakota bordering on Nebraska and bounded in part by the Missouri river, formed since the census of 1870; about 1150 sq. miles. Surface for the most part level.

GREGORY IV., d. 844. He was a native of Rome, and was raised to the chair of St. Peter in 827. He is remembered for re-building Ostia as a defense for the mouth of the Tiber.

GREGORY V. (BRUNO), d. 999. He was a relative of the emperor Otho II., and was pope from May 996 until his death. His authority was disputed by an antipope, John XVI.

GREGORY VI., JOHN GRATIANUS, a priest in Rome, chosen pope in 1045. He resigned the next year, and a year afterwards died in the monastery of Cluny.

GREGORY VIII., ALBERTO DE MORA, succeeded pope Urban III., Oct. 21, 1187. Eight weeks afterwards he died.

GREGORY IX., UGOLINO, became pope in 1227, and died 1241. He had a long dispute with the emperor Frederick II., whom he twice excommunicated. The emperor marched upon the papal territories, took Ravenna, and intercepted a fleet from Genoa which was conveying a hundred church dignitaries to Rome. Gregory died before the trouble was settled, and his successor made haste to become the friend of the emperor.

GREGORY X., TEBALDO VISCONTI, 1209-76; canon, archdeacon, cardinal, and pope, Sept. 1, 1271. He held the second general council of Lyons, and was one of the last church leaders to urge crusades for the recovery of the holy land where he had once been papal legate.

GREGORY XI., PIERRE ROGER, 1329-78; the last of the French popes, having been chosen in 1370. He was the last pope to reside in Avignon, and himself removed thence to Rome. The works of Wycliffe came under his censure.

GREGORY XII., ANGELO CORARIO, 1325-1417; a Venetian, chosen pope, in 1406. He pledged himself (to the council of Constance) to abdicate the moment other constants for the chair of St. Peter did so, and finally abdicated.

GREGORY XIV., NICOLO SFONDRATI, d. 1591; a native of Cremona. He was elected to the papacy in 1590, and died the next year.

GREGORY XV., ALESSANDRO LUDOVISIO, 1554-1623; a native of Bologna, chosen pope in 1621. The congregation for the propagation of the faith was established by him; and to him is due the secret balloting for new popes.

GREGORY XVI., BARTOLOMEO ALBERTO CAPELLARI, 1765-1846; a Venetian who became a monk, was learned in eastern languages, and a teacher of theology. When Napoleon carried Pius VII. away as a prisoner in 1809, Capellari left Rome for his native place and remained in quiet for three years. On the return of the pope he was promoted to various important positions, and in 1826 was a cardinal and the prefect of the propaganda. In this capacity he was practically minister of foreign affairs. He made an agreement with the Netherlands touching Roman Catholic citizens, regulated church matters in the United States, and from the sultan got emancipation for the Catholics in Armenia. He was elected to the papacy Feb. 2, 1831, and for 15 years was zealous and energetic in promoting the interests and expanding the power and influence of the church.

GREGORY, FRANCIS H., 1789-1866; b. Conn.; from merchant service he went into the navy in 1809, and rose through all grades to rear-admiral. His first work was in capturing vessels running slaves into southern ports, and suppressing piracy. In the war of 1812 he was captured and kept in England a prisoner for a year and a half. In the war with Mexico he took an active part. When the rebellion began he was too old for active sea service, and was made superintendent of the construction of iron-clad vessels.

GREGORY, OLINTHUS GILBERT, LL.D., 1774-1841; b. England; a mathematician; author of *Use of the Sliding Rule*, and *Treatise on Astronomy*; prof. at Woolwich. Among his works are a *Treatise on Mechanics*, *Evidences of Christianity*, and lives of Robert Hall and Mason Good.

GREGORY, SAINT, the "Illuminator;" b. 257 A.D.; founder and patron saint of the Armenian church. He belonged to the royal race of the Arsacides, being the son of a certain prince Anak, who assassinated Chosroes of Armenia, and thus brought ruin on himself and his family. His mother's name was Okohe, and the Armenian biographers tell that at the time of his conception he came under the holy influence of the apostle Thaddeus. Educated by a Christian nobleman, Euthalius, in Cæsarea in Cappadocia. Gregory sought, when he came to man's estate, to introduce the Christian doctrine into his native land. At that time Tiridates I., a son of Chosroes, sat on the throne, and, influenced partly it may be by the fact that Gregory was the son of his father's enemy, he subjected him to much cruel usage, and imprisoned him for fourteen years. But vengeance and madness fell on the king, and at length Gregory was called forth from his pit to restore his royal persecutor to reason by virtue of his saintly intercession. The cause of Christianity was now secured; king and princes and people vied with each other in obedience to Gregory's instructions, and convents, churches, and schools were established. Gregory in 302 received consecration as patriarch of Armenia from Leontius of Cæsarea, and in 318 he appointed his son Aristax to be his successor. About 331 he withdrew to a cave in the mountain Sebul in the province of Daramalia in upper Armenia, and there he died a few years afterwards unattended and unobserved. When it was discovered that he was dead his corpse was removed to the village of Thordanum or Thortan. The remains of the saint were scattered far and near in the reign of Zeno. His head is said to be now in Italy, his right hand at Etchmiadzin, and his left at Sis.

GREINER, JOHN, 1810-71; b. Penn., but early removed to Ohio, where he was conspicuous as a whig leader. He was the first to introduce popular songs in campaign work, and wrote a large number. He was governor of New Mexico in 1852. Afterwards he edited the *Columbus Gazette* and the *Zanesville Times*. His last public position was sub-treasurer in Santa Fé.

GRELLET, STEPHEN, 1773-1855; b. France. He was one of the body guard of Louis XVI.; but after the king's execution fled to Demerara. He was in New York in 1795, and there abjured the Roman Catholic religion and joined the Friends. During the yellow fever in Philadelphia in 1798, he was untiring in attentions to the sick and the dying. Subsequently he traveled over the union, Canada, England, France, Germany, and the Scandinavian kingdoms as a missionary. He also visited Russia, Greece, and Italy; and held audiences with the czar and pope, delivering a sermon before his holiness. A few years afterwards he made another tour in Europe, when he settled in Burlington, N. J., where he died.

GRENADA, a co. in n. central Mississippi on Yellabusha river, and the New Orleans, St. Louis and Chicago railroad; 450 sq.m.; pop. 70,10,751—6,642 colored. The surface is level, and about half is covered with forests. The soil is good; chief productions: cotton, corn, and pork. Co. seat, Grenada.

GRENVILLE, a co. in Ontario, Canada, on the St. Lawrence and Rideau rivers, and traversed by the Grand Trunk and the St. Lawrence and Ottawa railroads; 464 sq.m.; pop. 71,22,616. Chief town, Prescott.

GRENVILLE, RICHARD TEMPLE. See **TEMPLE**, EARL.

GRENVILLE, **GREENVILLE**, or **GRANVILLE**, Sir RICHARD, 1540-91; a relative of sir Walter Raleigh. While a boy he served against the Turks in a German corps. Returning home, he was given a command in Ireland, and became sheriff of Cork. In 1571 he was in parliament; subsequently, sheriff of Cornwall; again in parliament, and knighted by queen Elizabeth. He was enthusiastic in Raleigh's projects for founding colonies in America, and in 1585 was chief officer of a fleet carrying 108 settlers to Carolina. On the way he captured two Spanish frigates, and finally landed at Roanoke. Leaving the settlers in charge of Ralph Lane, he returned to England, and on the way took a Spanish ship with a rich cargo. He returned the next year with supplies, but found the colony scattered, the people having been taken away by sir Francis Drake. In 1591 he was made vice-admiral, and sent with a small fleet against the Spaniards to the West Indies. Off the Azores he had a hard fight, sinking four of the enemy's ships, and killing, it is supposed, 1000 men. He was wounded, but refused to leave the deck. Finally, he was shot through and died three days afterwards.

GRESLON, ADRIEN, 1618-97; b. France. He was a Roman Catholic missionary in the Huron country, and some time later in China. There is a story that he met an American Indian woman in Tartary who had been sold from one tribe to another. It was discovered from this that there was ready communication between Asia and western America.

GRESSET, JEAN BAPTISTE LOUIS, 1709-77; a French poet, author of *Vert Vert*; *La Carême Improptu*; *Le Lutrin Vivant*; *La Chartreuse*; *Les Ombres*; and other works in verse, and dramatic pieces. In 1748 he was made a member of the Academy. Later in life he became subject to deep religious impressions, and publicly regretted the frivolous nature of some of his writings, for which he was sharply censured by Voltaire.

GRESWELL, EDWARD, 1797-1869; b. England, graduated at Oxford, and turned his attention to theological writing. Among his works are *Exposition of the Parables and Parts of the Gospels*; *Dissertation upon the Principles and Arrangement of a Harmony of the Gospels*, and a dissertation on the calendar, besides some books in Latin.

GRETA, a river in Yorkshire, Eng., running e. and n. to the Tees. Another of the name is in Cumberland, and empties into the Derwent.

GRÉTRY, ANDRÉ ERNEST MODESTE, 1741-1813; b. France. He studied music under many disadvantages, but his composition for Marmontel's *Le Huron* brought him at once into notice. After this came *Lucile*; *Zémire et Azor*; *Céphale et Procris*; *Richard Cœur de Lion*; *Barbe-Bleue*, and many other operas, both comic and serious. He had been 16 years dead when his *William Tell* was produced. Grétry was one of the founders of French comic opera.

GREUZE, JEAN BAPTISTE, 1726-1805; a painter, b. France. Having no success at portraits he undertook compositions on natural subjects and current life, though much preferring allegorical, scriptural, and historical work. Among his best achievements are "The Blind Man Cheated;" "The Village Bride;" "The Broken Pitcher;" "The Unnatural Father," and "The Little Girl and the Dog." Many of his productions have been issued in engravings. He was remarkable as a colorist, particularly for flesh-tints, and for his originality in genre painting.

GREVILLE, CHARLES CAVENDISH FULKE, 1794-1865; great-grandson of the fifth earl of Warwick. He was educated at Eton and Oxford, and became clerk of the council in 1821, which office he held nearly 40 years, serving under three sovereigns. Well-born, well-bred, handsome, and accomplished, Greville led the easy life of a man of fashion, taking an occasional part in the transactions of his day, and much consulted in the affairs of private life. But the celebrity which now attaches to his name is entirely due to the posthumous publications of a portion of a journal or diary which it was his practice to keep during the greater part of his life. These papers were given by him to his friend Mr. Reeve, a short time before his death, with an injunction that they should be published, as far as feasible, at not too remote a period after the writer's death. The journals of the reign of George IV. and William IV. (extending from 1820 to 1837), were accordingly so published about 10 years after the event. Few publications have been received with greater interest by the public; five large editions were sold in little more than a year, and the demand in America was as great as in England. These journals were regarded as a faithful record of the impressions made on the mind of a competent observer, at the time, by the events he witnessed and the persons with whom he associated. Their characteristic is the love of truth, of justice, and of sincerity. The court was irritated at the scornful disclosure of the vices and follies of former

sovereigns, and fashionable society was annoyed at the writer's absolute indifference to its pretensions. But Greville did not stoop to collect or record private scandal. His object appears to have been to leave behind him some of the materials of history, by which the men and actions of his own time would be judged. He records not so much public events as the private causes which led to them; and perhaps no English memoir-writer has left behind him a more valuable contribution to the history of this century. Greville published anonymously, in 1845, a volume on the policy of England to Ireland, in which he advocated the payment of the Roman Catholic clergy; he was also the author of several pamphlets on the events of his day. [*Encyc. Brit.*, 9th ed.]

GREVILLE, Sir FULKE, Lord BROOKE, 1554—1628; an English poet, educated with his cousin, sir Philip Sidney. He traveled abroad and became acquainted with some continental languages. In 1620 he was made a peer. Eight years afterwards he was murdered by a servant who was so stricken with horror at the deed that he killed himself with the same sword. Among Greville's works are a biography of Sidney, a treatise on human learning, another of fame and honor, and one on war, besides poems.

GREW, MARY, b. Conn., 1813; daughter of Henry Grew, a Baptist clergyman; educated in Catherine E. Beecher's seminary in Hartford. In her youth, when New England was greatly agitated by the controversy between the old-school and new-school theology, she received a training in metaphysics which made her a skillful logician. In childhood she was deeply interested in the condition of the colored people, both free and slave, and was therefore prepared to adopt the fundamental principle of immediate emancipation of slaves as the duty of the master and the right of the slave. Her public addresses combined the skill of the trained logician with the warmth of womanly sympathy, and she was therefore highly popular as a speaker. She was not less skillful with the pen. As corresponding secretary of the Philadelphia female anti-slavery society, she wrote its annual reports for nearly or quite 30 years in succession, and so unique were they in their impressiveness that they excited a degree of public attention rarely awarded to such documents. At different times also, she was the editor of the *Pennsylvania Freeman*, the organ of the Pennsylvania anti-slavery society. She was educated a Baptist, but is now connected with the Unitarians, in whose pulpits she occasionally preaches. She is an earnest advocate of woman suffrage. She has resided in Philadelphia since 1834.

GREY, a co. in n.w. Ontario, Canada, on Georgian bay; 1,800 sq.m.; pop. '71, 59,395. The land is good for all ordinary agricultural uses. Chief town, Owen Sound.

GREY, HENRY GEORGE, Earl, b. England, 1802; educated at Oxford, and under the title of lord Howick in 1826 a member of the house of commons. In his father's ministry formed in 1830 he was under secretary for the colonies, and afterwards for the home department. Under Melbourne he was secretary of war. After the death of his father in 1845 he took his place in the house of lords, as earl Grey. Under the Russell administration he was secretary for the colonies, retiring in 1852, in which year he published an *Essay on Parliamentary Government as to Reform*.

GREY, Lady JANE, an English lady of royal birth and singular misfortunes, was the eldest daughter of Henry Grey, marquis of Dorset, afterwards duke of Suffolk, and lady Frances Brandon. Lady Frances was the daughter of Charles Brandon, duke of Suffolk, and of Mary, sister of Henry VIII., who had been married to Louis XII., of France, but had become a widow. Lady Jane Grey was born at Broadgate, Leicestershire, in 1537. Having discovered, at an early age, surprising talents, she was furnished with an excellent tutor, Aylmer, afterwards bishop of London, and under his care, made extraordinary progress in arts and sciences, and particularly in languages, being able to speak and write Latin and Greek, as well as French and Italian. We have the testimony of Roger Ascham, that he found her reading the *Phadon* of Plato in Greek, while the rest of the family were engaged in hunting. She also sang and played well, and was versed in other feminine accomplishments.

In 1553, after the fall of Somerset, the dukes of Suffolk and Northumberland, now ruling in the name of the youthful king Edward VI., and foreseeing his speedy death, determined to change the succession to the crown, and secure it to their own families. Lady Jane Grey, now sixteen years old, was therefore married to lord Guilford Dudley, fourth son of the duke of Northumberland, in May, 1553. The king, failing in body, and weak in mind, and surrounded by selfish or fanatical advisers, was persuaded to make a deed of settlement, setting aside the right of succession of his sisters Mary and Elizabeth, and Mary Queen of Scots, leaving the crown to lady Jane, who was innocent of the conspiracy. After the king's death her ambitious relatives hailed her as "queen." Lady Jane at first shrunk from honor so treacherously won, but ultimately yielded to the force of their entreaties and commands, and allowed herself to be proclaimed. The people of England resented the unscrupulous conduct of Suffolk and Northumberland, and learned, brilliant, and amiable as lady Jane was, they rallied, with the true English instinct of loyalty, round Mary. Northumberland was defeated, sent to the tower, and beheaded Aug. 22, 1553; and in the following Nov. lady Jane and her husband were also condemned. For a while Mary hesitated to pronounce sentence of death against the young couple, but at length she issued the fatal warrant on Feb. 8, and, four days

after, both were executed. Lady Jane reigned only ten days. She met her fate with remarkable firmness, making a brief address, in which she confessed the justice of her sentence ; but said : " I only consented to the thing I was forced into." Several epistles and other writings attributed to her are extant.

GREYLOCK, a mountain near the village of South Adams, Berkshire co., Mass., 3,500 feet in height ; the highest land in the state, commanding a remarkably fine view, overlooking the valley of the Hoosac and its villages on the n., beyond which are visible the peaks of the Green Mountains ; a little to the e. 60 m. off are Mts. Monadnock and Wachusett ; 40 m. s.e. are Holyoke and Tom ; on the s. the Berkshire hills and Mt. Everett, and Pittsfield and its lakes and villages ; s.w. far away across the Hudson are the Catskills. Near to Greylock are Saddle Ball and Saddle Mount.

GREYTOWN, SAN JUAN DE NICARAGUA, or SAN JUAN DEL NORTE, the chief seaport of Nicaragua at the mouth of the San Juan near the Caribbean sea ; 10° 55' n. ; 83° 42' w. ; pop. about 1200. The harbor, if not neglected, would be one of the finest on the coast. The famous Nicaragua route for a ship-canal to the Pacific begins at Greytown. The place has considerable trade in India-rubber, hides, cocoa-nuts, rose-wood, etc.

GRIDLEY, JEREMY, 1702-67 ; b. Boston ; educated at Harvard, and was for a short time editor of a newspaper called the *Weekly Rehearsal*. He was eminent as a lawyer, and became attorney-general for the province.

GRIDLEY, RICHARD, 1711-96 ; b. Boston. He was in the engineer service at the siege of Louisburg, was in the Crown Point expedition in 1756, and erected the works at lake George. He served under Amherst and Wolfe, and when the revolution began he directed the construction of the works on Breed's hill the night previous to the Bunker hill battle. He rose to the rank of maj.gen.

GRIERSON, BENJAMIN H., b. Penn. 1827. In the war of the rebellion he rose from maj. to maj.gen. of volunteers, and was especially famous as a leader of dashing and hazardous cavalry expeditions or raids. After the war he was appointed col. of cavalry in the regular army.

GRIFFIN, CHARLES, b. Ohio, 1826 ; graduated at West Point ; served in the Mexican army and on frontier duty. He became a capt. in 1861, and was at the first battle of Bull Run ; rose through various grades to brevet maj.gen. of volunteers, and after the war was appointed col. of the 35th infantry in the regular army. He was one of the commissioners to carry out the terms of Lee's surrender, being at that time in command of the 5th corps.

GRIFFIN, CYRUS, 1749-1810 ; b. Va. ; was in the legislature, and in the colonial congress two terms, presiding over that body in 1788. From 1789 he was judge of the United States district court for Virginia.

GRIFFIN, EDWARD DORR, D.D., 1770-1837 ; b. Conn. ; graduated at Yale, and was pastor of a Congregational church in 1795 ; afterwards pastor in New Jersey ; in 1808 professor of sacred rhetoric at Andover, and in 1811 pastor in Boston, where he published the *Park Street Lectures*, an exposition of the doctrines taught by John Calvin. In 1821 he was chosen president of Williams college, where he remained until 1836. He published a number of works.

GRIFFIN, GERALD JOSEPH, 1803-40 ; b. Ireland ; at the age of 20 went to London to undertake a literary career, taking along a play for which he found no market. He then sent prose articles and poems to the newspapers and magazines, and soon began to be favorably known as a promising author. Among his works are *Tales of Munster Festivals* ; *The Colleen Bawn* ; *The Invasion* ; *The Duke of Monmouth* ; *The Rivals* ; and many poems.

GRIFFIS, WILLIAM ELLIOT, b. Philadelphia, 1843 ; a clergyman of the Reformed church, a traveler and educator in Japan. When 22 years of age he turned from business life and entered Rutgers college, graduating 1869. After traveling in Europe he studied one year at the theological seminary at New Brunswick, N. J. ; then accepted appointment to organize schools on the American model in Japan, and was the first American teacher in regions beyond the open ports. On the fall of the feudal system, and the unification of the empire, he was appointed professor of the physical sciences in the imperial university of Tokio. He prepared the *New Japan Series* of reading and spelling books and primers for Japanese students of the English language, and contributed to the Japanese press and to newspapers and magazines in the United States numerous papers of importance on Japanese affairs. Returning to New York, 1874, he finished his theological studies at the Union theological seminary ; and, in 1877, became pastor of the Reformed church, Schenectady, N. Y. He is the author of *The Mikado's Empire* ; also of a collection of the fairy tales and folk lore of the Japanese, and of a *History of Corea*.

GRIFFITH, WILLIAM, 1810-45 ; b. England ; educated at London university ; and was assistant surgeon in India. He took much interest in botanical studies, and made large and valuable collections of plants. His name has been attached to a genus of rubiaceaceous plants.

GRIMALDI, an ancient and noble family of Genoa, who were princes of Monaco from the 10th to the 17th century. The most eminent of the Grimaldis were: 1. RANIERI, who commanded a fleet in the service of Philip the fair (of France) in 1304, defeating and making prisoner Guy of Flanders. 2. ANTONIO, distinguished in naval warfare in the early part of the 14th century. He was successful over the Aragonese and Catalonians until 1353, when they nearly destroyed his fleet. 3. GIOVANNI, another naval commander, who defeated Trevesani, the Venetian admiral on the Po, taking 28 galleys, a whole fleet of transports, and much other spoil. 4. DOMENICO, like the others distinguished at sea, especially in the battle of Lepanto. He was also a cardinal and vice-legate of the Avignon, noted for his efforts to exterminate heresy. 5. GERONIMO, 1579-1685; was a cardinal, and made great efforts to reform the manners of the clergy. He founded a hospital for the poor, and distributed in alms 100,000 livres a year.

GRIMES, a co. in e. central Texas on the Navosota and Brazos rivers, reached by the Houston and Texas Central railroad; 902 sq.m.; pop. '70, 13,218—7,921 colored. It is mostly level, and a large portion is covered by forests. Soil good. Chief productions: cotton, corn, cattle, and pork. Co. seat, Anderson.

GRIMES, JAMES WILSON, LL.D., 1816-72; b. N. H., graduated at Dartmouth, and followed the legal profession. He settled in Iowa, was in the territorial and state legislature, and in 1854 was elected governor. In 1859 he was U. S. senator, being re-elected in 1863. At the beginning of the war of the rebellion he was the originator of the first act of emancipation by inducing the president to set free a number of fugitive slaves who had been put in jail in Washington.

GRIMKÉ, ANGELINA, 1805-79; b. Charleston, S. C.; an American abolitionist, youngest daughter of judge Grimké, and sister of Thomas S. Grimké, the distinguished opponent of nullification in 1830-31. Belonging to a family of the highest social rank, and born in one of the strongholds of slavery, she saw in her earliest childhood the cruel wrongfulness of the system; and in the earliest years of ripening womanhood, with all the charm that beauty, intelligence, and family distinction could give, she tore herself from home and friendships and became an exile among strangers, in order that she might more effectually plead the cause of the slaves. As a child she was shocked by the cruelties to which the slaves were exposed, and she would sometimes steal out of the house in the darkness, with her bottle of oil and other simple medicaments, and do what she could to alleviate the sufferings of some poor creature who had been terribly whipped. At an early age she united with the Presbyterian church, and her religious experiences served to intensify her hostility to slavery. Every effort was made to overcome what were regarded as merely her childish and fanatical scruples. When she was 16 years of age her mother gave her a slave girl to be her waiting-maid. "You are to have her as your property," said the mother. But Angelina said firmly, "I cannot have a slave. The girl belongs to herself, not to me. Besides, I don't need to be waited on; I can wait on myself." No persuasion could induce her to become a slaveholder. As a teacher in a Sunday-school, she could not fail to see the contrast between the privileges of instruction enjoyed by her pupils and the deprivations of the slaves, whom she could not even teach to spell the name of God without breaking the law. Finding that moral instruction was not prohibited, she besought her mother for permission to call the slaves of the household every morning for social worship. When they were assembled the young girl read to them the words of Christ, spoke to them tenderly of the simple truths of the gospel, and then knelt and prayed with them. Such was her daily practice so long as she remained under the paternal roof. She endeavored to impress upon the officers of the church a sense of what they should do for the slaves, but her pleadings found no response. Through an elder sister in Philadelphia she heard of the Quakers and their opposition to slavery. She read their books and was charmed, and finding that there were in Charleston two aged Friends who met every Sunday for worship, she discarded her fashionable attire, put on the simple Quaker garb, and for a whole year afterwards, when the family carriage rolled away on Sunday morning to St. Philip's, walked alone to the Friends' meeting-house, and sat down with these two aged Friends under a canopy of silence, where no word was ever spoken. This was while there was yet no public movement against slavery; she was following her own heartfelt convictions and longing for further light. News of Garrison's imprisonment in Baltimore reached her, carrying with it, however, a weight of opprobrium upon his name. What could she do? She was convinced that it was impossible for one in the midst of slavery to act effectually against it. Self-exile seemed the only alternative. The thought of this brought peace. Her sister in Philadelphia had united with the Quakers; she would join her and find in the free north her home and her work. In the fall of 1830 she left all, never to return. The rising anti-slavery movement at once enlisted her sympathy, but how to give it any help she did not at first see. At length light dawned upon her, and she was impelled to prepare an *Appeal to Christian Women of the South*. She timidly submitted the manuscript to the executive committee of the American anti-slavery society, by whom it was read with wet eyes. It was published and sent in large quantities to the south. In Charleston it created a strong excitement, and, with other publications of the same character, formed a pretext for breaking open the post-office and making a bonfire in the public square. Not long after this it was understood in Charleston, that she

intended to visit her mother and sister and pass the winter with them. Thereupon the mayor called upon her mother, and desired her to inform her daughter that the police had been instructed to prevent her landing, and that, if she should elude their vigilance, and go ashore, she would be arrested and imprisoned. When these threats were communicated to her, she replied that she knew she could not go to Charleston without compromising and distressing her family, but, were it not for this fact, she would certainly exercise her constitutional right as an American citizen to visit her relatives, submitting willingly to any pains and penalties that might be inflicted upon her, believing as she did that any violence she might be called upon to suffer would serve to reveal the true nature of slavery and intensify the opposition to it in the free states. Remaining in Philadelphia, and acting in co-operation with her sister, she was exerting a strong private social influence in favor of the anti-slavery cause. As yet she had not lifted up her voice in public, nor addressed any private assembly of women, nor in any other way transcended the conventional rules by which the activity of women was limited. But now came an invitation to her from the American anti-slavery society to go to New York for the purpose of meeting women in private parlors and laying before them her experiences as a southern woman, and pleading with them to lend their influence for the overthrow of slavery. She said, "I feel this to be God's call," and resolved at once to obey it. Her sister, Sarah Moore Grinné, 13 years older than herself, who was in full sympathy with her in her opposition to slavery, concluded to join her, and together they went to New York in Nov., 1836. The society had offered them a modest salary, which they declined, preferring to labor at their own cost. Their visit made no small stir in a city already much excited upon the slavery question. Many private parlors were opened to them and crowded by women eager to listen and to learn. Their addresses made a profound impression upon all who heard them. Angelina especially disclosed remarkable power as a speaker, and the traditions of her eloquence have survived the overthrow of slavery. Parlors becoming too small for the crowds that desired to attend, vestries and halls were substituted, and at last it was found necessary to open a large church, which in turn overflowed with the multitudes of women who thronged to see and hear. The fame of the sisters was widespread, and in 1837 they were called to Massachusetts, where for a time they continued to speak to women only; but so exciting were the reports of Angelina's eloquence that at length the barriers were broken down and men as well as women thronged their meetings. The lady speakers were by no means displeased on this account, for as Quakers they were as willing to address the one sex as the other. The excitement which had attended their labors was now mightily increased, a strong opposition to their course was developed, the "woman question" was discussed on every side, dividing the abolitionists into two hostile camps, and for a time Massachusetts, and indeed all New England, was deeply agitated. Here began the modern movement for enlarging the sphere of woman's opportunities and activities which has borne so many fruits already and is still an absorbing theme of discussion. The South Carolina ladies welcomed the discussion, but did not suffer themselves to be drawn aside from their special work. Angelina especially was in wide demand. Night after night she spoke to crowds that filled the old Boston theater to its utmost capacity. Her audiences were composed of people of intelligence and culture, and her thrilling appeals did much to modify the prevailing pro-slavery sentiment of the times. A committee of the Massachusetts legislature invited her to address them in the hall of representatives, where she was heard with close attention and deep respect by eminent citizens from every part of the state. In all these labors, according to the testimony of those who witnessed them, she never lost one of her purely feminine qualities. Graceful, gentle, retiring, she won universal respect and admiration. In May, 1838, she was married to Theodore D. Weld. It was far from her expectation that her public labors were now ended; but early in her married life she was twice severely injured, and thereby incapacitated for further public speaking. Her husband founded a school, to which for many years she gave her attention as her health permitted. Her sister went with her into retirement, and was also engaged in Mr. Weld's school. They still maintained their interest in the anti-slavery cause, and both of them lived to rejoice in its complete triumph. Sarah died at Hyde Park, Mass., 1873; Angelina, 1879.

GRIMKÉ, FREDERICK, 1791-1863; brother of Thomas, b. S. C. He settled in Ohio, where he was for a long time judge of common pleas and of the supreme court. He published *The Nature and Tendency of Free Institutions*, and an essay *On Ancient and Modern Literature*.

GRIMKÉ, THOMAS SMITH, LL.D., 1786-1834; b. S. C., graduated at Yale, and studied law. He was active in political life, and vigorously opposed South Carolina's nullification projects. He was a thorough scholar, and the author of a number of addresses on science, education, and literature. He was one of the early advocates of peace and a promoter of the American peace society. One of his hobbies was a reform in the spelling of the English language, but he was too far ahead of the age to get a hearing.

GRINDAL, EDMUND, 1519-83; an English prelate, private chaplain to bishop Ridley, and chaplain to king Edward VI. When Mary came into power he went to the continent and remained until her death. On returning he was one of the makers of a

new liturgy, and one of seven ministers chosen to oppose the Roman Catholics in open discussion. He was bishop of London, succeeding Bonner, and afterwards bishop of York. In 1575 he was made archbishop of Canterbury. He became blind in 1582.

GRINDING AND CRUSHING MACHINERY. Most of the improvements in grinding and crushing machines have been made within the last 30 years, particularly as relates to crushing and breaking. Until the development of the gold fields of California subsequent to the year 1849, in which was the commencement of the great migration thither, the breaking of stones and ore was performed usually by hand, with a sledge, in connection with blasting. The first machine on the Pacific coast consisted of immense weights, raised by cans to a height of 4 or 5 ft., and let fall upon the rock. A machine having a weight of one ton had a capacity of breaking one ton of quartz rock an hour. There was no mortar or trough, but the rock was placed on the face of an anvil, around which there was a grating through which fell all the pieces broken sufficiently fine. Coarser pieces could be replaced upon the anvil. A machine more easily worked, and very effective, was invented by Mr. Eli Whitney Blake, of New Haven, Conn. A very heavy, stationary, vertical plate forms one side of a wedge-shaped hopper, which is at the same time the crushing chamber. The other side of the hopper is formed by a movable jaw which turns upon a pivot at the upper end, the lower end coming as near the stationary piece as the required size of the fragments. This jaw is moved backwards and forwards through the space of about one quarter of an inch, by means of a toggle joint which is moved by a wheel. A rubber spring aids in drawing the jaws apart suddenly, thus facilitating the descent of the rocks in the wedge-shaped hopper. The product of crushed matter varies with the different sizes from 3 to 7 cubic yards per hour, the horse-power varying from 4 to 12. Hall's breaker is a modification of Blake's, the movable jaw consisting of two pieces which play alternately. For further notice of rock-crushing machinery, see **METALLURGY**, and for sugar-cane crushing-machines, see **SUGAR**. In the article **MILL** there is a description of grindstones and machinery for making flour. There are various other forms of mills for other purposes, such as the crushing of seeds and bark, and grinding of paints. Very powerful mills are required in the preparation of vulcanized India-rubber (caoutchouc). The crude India-rubber, after being boiled and softened in a steam vat, is passed between two fluted rollers of very great strength, by which it is ground to a sort of paste. A kind of mill used for crushing seeds, grinding chocolate, mixing mortar, etc., consists of two vertical wheels turning independently upon the ends of an axle, which also turns upon a vertical pivot midway between the two wheels. A circular bed or vat, having a rim of greater or less height, receives the article to be ground, over which the wheels or rollers are made to revolve. One of the most ingenious, simple, and effective mills in use was the invention of Mr. James Bogardus, of New York city. Two wheels, having on their faces concentric grooves, have different axes of revolution, being eccentric, a name given to the mill. The wheels are placed horizontally, and the lower one is turned by a shaft at the rate of from 600 to 800 revolutions per minute. The upper wheel also takes on a motion from the impulse of material brought against it, but being eccentric, the material is brought diagonally against the edges of the groove, making the grinding very effective and preventing clogging. Over 200 barrels of sugar have been ground per hour in a 16-in. mill. It will grind 5 tons of oil-cake, half a ton of bark, two tons of white lead in oil, four tons of iron-ore, and two tons of any ores per hour. It is very strong and not easily disordered.

GRINDSTONES (*ante*) are mounted more or less simply, from the stone disk fixed on a horizontal spindle carried on the tops of two posts rudely set in the ground, with a winch handle, or crank and treadle, to the large stones employed in cutlery manufactories, turned by machinery at a speed as great as practicable without bursting the stone by the centrifugal force. Grindstones are commonly made of sandstone, of which, suitable for the purpose, there are quarries in the northern coal districts and the midland counties of England, and in Nova Scotia. Some of the best grindstones in the United States are brought from Berea, Ohio. Artificial grindstones of very uniform and perfect texture are made with emery (q. v.), in great variety of size and form, adapted to various uses; and are much used for work on metal surfaces, dispensing with slow and laborious hand-filing. Emery-wheels are made as large as 3 ft. in diameter, and so strong that they can be driven at 6,000 ft. per minute, when they will readily cut tempered steel. They wear very slowly, and when properly used keep themselves true. If a true surface is lost it can be restored only with a diamond, that alone being hard enough for the purpose.

GRINNELL, a village in Poweshiek co., Iowa, on the Central Iowa railroad, 55 m. e. of Des Moines; pop. 1,480. It is the seat of Iowa college (Congregational) founded in 1848. There is considerable manufacturing business in the village.

GRINNELL, HENRY, 1799-1874, brother of Moses II., and a partner in the great commercial house of Grinnell, Minturn & Co., New York. Having amassed a considerable fortune by his skill and success as a merchant, Mr. Grinnell devoted the latter part of his life to the extension of geographical knowledge, mainly in connection with the arctic regions. In 1850 he undertook the expense of fitting out an expedition in search of information concerning the ill-fated Franklin and Crozier expedition of 1845. The

expedition comprised two vessels, and was commanded by lieut. De Haven, U.S.N. Unsuccessful in the immediate object of their search, the explorers were fortunate enough to make important additions to existing geographical knowledge of the polar regions. They discovered the extensive tract of land divided by Smith's Sound from Greenland, and named "Grinnell Land" after the enterprising and munificent New York merchant. This discovery brought about a sharp controversy with English geographers and explorers as to priority, which was finally concluded in favor of the American expedition, and the name "Grinnell Land" affixed permanently in place of that of "Prince Albert Land," which had been given it by the British. In 1853 Mr. Grinnell, with the aid of Mr. George Peabody, fitted out for a second expedition, the brig *Advance* commanded by Dr. Elisha Kent Kane, who had sailed as surgeon and naturalist with De Haven. This expedition doubtless accomplished more than any which had preceded it, having first definite evidence of the existence of an open polar sea, and defined the coast-line, and explored the interior of hitherto unknown lands. See KANE, E. K. Mr. Grinnell was the first president of the American geographical society, and his name and services are held in high respect both in America and England, and in the latter country, his liberal example induced such energy and enterprise as eventually resulted in clearing up the long mooted question of the fate of the Franklin expedition.

GRINNELL, MOSES H., 1803-77; b. Mass.; an eminent New York merchant, the head of the firm of Grinnell, Minturn & Co. He was a representative in congress in 1839-41; and in 1869-71 collector of customs at New York.

GRINNELL LAND, the most northerly land of the American continent so far as discovered. It is separated from Greenland by Kennedy's channel. Lieut. De Haven, who commanded the ships sent out by Henry Grinnell from New York in 1850, claimed to have been the first discoverer, but the English also make their claim. In 1871 capt. Hall examined the e. coast as far up as $82^{\circ} 16'$, a few miles above which point the shore appeared to incline westward. This land is nearer to the pole than any other now known; the n. limits of Greenland have not been explored.

GRIQUAS, or BASTAARDS, people of s. Africa who are the offspring of native women by Dutch settlers. There are probably 15,000 of them on Orange river near the n. limit of Cape Colony. Some of them are partially civilized, and a considerable number are counted as Christians. There is a thriving settlement at Griqua Town, about 500 m. n.e. of Cape Town. Their chiefs are chosen by suffrage, and there are among them many prosperous farmers and cattle breeders.

GRISCOM, JOHN, LL.D., 1774-1852; b. N. J.; studied in a Quaker academy, and at 17 began to teach. He was a teacher in New York for a quarter of a century. He made a tour in Europe to inspect institutions of charity, reform, and education, including manufactories, publishing his observations in *A Year in Europe*. The New York high school, forerunner of the free academy and the normal college (now the college of New York) was projected and for six years supervised by him. He was also one of the founders and secretary of a society for the prevention of pauperism. His latest work was the reform of the school system of New Jersey.

GRISCOM, JOHN HOSKINS, 1809-74; b. New York, son of John, the teacher. He was educated in medicine at Rutgers college, and Pennsylvania university, and for many years practiced in New York, being professor of chemistry in the college of pharmacy, and 24 years physician to the city hospital. He was also an active member of the prison association. Among his works are *Animal Mechanism and Physiology*; *Uses and Abuses of Air and Means for the Ventilation of Buildings*; *First Lessons in Physiology with Brief Rules for Health*; *Sanitary Legislation, Past, Present, and Future*, etc.

GRISWOLD, ALEXANDER VIETS, D.D.; 1766-1843; b. Boston. In 1795 he was ordained, and began preaching in three different towns besides teaching school. In 1804 he went to Bristol, R. I. He was the first bishop of the Protestant Episcopal diocese comprising Vermont, New Hampshire, Massachusetts, and Rhode Island. His last public act was the consecration of his successor, Dr. Eastburn. He published a large number of his discourses, and a volume of *Sermons on the Most Important Doctrines and Duties of the Christian Religion*.

GRISWOLD, MATTHEW, LL.D., 1716-99; b. Conn.; governor of the state in 1784; afterwards judge of the supreme court. He presided over the convention that ratified the constitution of the union.

GRISWOLD, RUFUS WILMOT, D.D., 1815-57; b. Vt. In early life he was a roving printer. Studying divinity, he became a Baptist minister, but most of his work was in literature as associate editor of *The New Yorker*, the *Brother Jonathan*, and the *New World*. In 1842 he was editor of *Graham's Magazine*, and in 1850 he started in New York the *International Magazine*. He is best known by his *Poets and Poetry of America*, and *Prose Writers of America*. He also published *Curiosities of American Literature*, *Washington and his Generals*, *Napoleon and the Marshals of the Empire*, and *The Republican Court, or, American Society in the Days of Washington*.

GRONOVIVS, or GRONOV, JACOBUS, 1645-1716; son of Johann Freiderich, b. Holland. While young he became fully acquainted with classical authors, traveled in England, Spain, Tuscany, Italy, Venice, Germany, and other countries, to see for himself the treasures in their famous libraries, and finally settled as professor in the university of Leyden. He was a fierce and abusive controversialist, and had hot disputations with Fabretti, Vossius, Bentley, and others. He left 46 works, the most important of which is an ancient Greek thesaurus.

GRONOVIVS, or GRONOV, JOHANN FRIEDRICH, 1611-71; a Dutch scholar and critic, educated at Leipsic, and professor of Greek in Leyden. He wrote a large number of critical works on Latin classics, poetry, etc.

GROOT, GERHARD, or GERARD the GREAT, 1320-84; b. Holland; educated in Paris, and a teacher of theology at Cologne. He was not in holy orders, but held a number of benefices, living luxuriantly until turned from his ways by a Carthusian monk. He then gave up his benefices, and, refusing any higher position than deacon, became a traveling and highly successful preacher. He opposed the scholastics, advocated the reading of the scriptures, and translated the Psalms into the common language. He gathered a company for the transcribing of books of the Bible, and enforced upon them the practice of community of goods. From this association arose the "Brethren and Clerks of the Common Life." The order grew rapidly, and in spite of the violent opposition of the monastic orders they were sanctioned by the pope in 1376.

GROSE, FRANCIS, 1731-91; an English antiquary who traveled into many out of the way corners in search of objects of antiquity. He was jovial and somewhat dissipated in his youth, as Burns implies in his verses beginning "Ken ye aught of Captain Grose." Probably the best known of his works is the *Classical Dictionary of the Vulgar Tongue*, which has served as the foundation of many slang vocabularies in England and America. He wrote besides on English, Welsh, Irish, and Scotch antiquities, and on fortification, and was the author of a work entitled *A Guide to Health, Beauty, Riches and Honor*.

GROSS, SAMUEL D., LL.D., b. Penn. 1805. He graduated in medicine and began practice in Philadelphia, at the same time translating French and German medical works. In 1830 he published *Diseases of the Bones and Joints*. In 1833 he went to Cincinnati and was made demonstrator of anatomy in the college of Ohio, and soon afterwards professor of pathological anatomy, in Cincinnati college, where he delivered the first systematic course of lectures on morbid anatomy ever given in this country, which was published as a treatise under the title *Elements of Pathological Anatomy*, 2 vols. 8 vo. Boston, 1839. In 1840 he became professor of surgery in Louisville college, and in 1850 professor of surgery in the university of New York, but the next year returned to Louisville. In 1856 he was chosen professor of surgery in Jefferson medical college, and in 1867 was elected president of the American medical association. He is the author of several valuable works on medicine and surgery, but is best known as the author of one of the most comprehensive and valuable works on surgery, *System of Surgery*, 2 v. Svo.

GROSSETO, a province of Tuscany, Italy, on the Mediterranean, 1712 sq.m.; pop. '72, 107,457. It is mountainous, marshy, and to a large extent unfit for cultivation. Sugar, lumber, and coal are among the chief products. The principal town bears the same name.

GROSS-GLOGAU. See GLOGAU, *ante*.

GROS VENTRES, American Indians dwelling with the Arrapahoes on the upper streams of the Missouri river. Their greatest chief was Sitting Squaw, a friend of the whites. In 1870 they numbered about 1300. They have good lodges, on a reservation of 260 sq. miles.

GROTEFEND, GEORG FRIEDRICH, 1775-1853; b. Germany; educated at Gottingen, was rector in Frankfort, founded a society for the cultivation of the German language, and became director in the Hanover lyceum. He was the author of several works upon ancient and modern languages.

GROTON, a t. in New London co., Conn., on Long Island sound, intersected by the Stonington and Providence railroad; pop. 5,124. The township contains several thriving villages. One of the historical points is fort Griswold, where a white garrison was massacred early in the revolution by Tories.

GROTON, a village in Middlesex co., Mass., on the Nashua and Worcester railroad, 31 m. n.e. of the latter city; pop. '80, 1862. The Lawrence academy is an institution of importance, and there are other good schools.

GROUCHY, EMMANUEL, Marquis de, 1766-1847; entered the French republican army in 1790, and two years later was maj.gen. of cavalry in the campaign against Savoy. Subsequently he defeated the Vendéans, served under Moreau in Piedmont, and was taken prisoner by the Austrians, kept a year, then joined Moreau and fought at Hohenlinden, at Jena, Eylau, and Friedland, with conspicuous gallantry. He won further distinction at Wagram and Borodino. He commanded the emperor's guard on the retreat from Moscow. On the return of Napoleon from Elba he was made a marshal,

and in the close of the emperor's career, played a leading part, but by too literally obeying orders at the battle of Waterloo, he was the indirect cause of Napoleon's overthrow. Grouchy had been ordered to prevent the Prussians under Blucher from joining the English, and he obeyed to the letter. But had he taken the advice of his generals, and marched to Napoleon's aid at a time when the fight was so hot that Wellington cried "O for Blucher or night," he might have effected the entire defeat of the allies. He adhered to his orders, however, and Napoleon was lost. Under the second restoration he was proscribed, and for some years lived in Philadelphia, Penn. He returned to his native country in 1821, and after 1830 was restored to his rank of marshal.

GROUND HOG. See WOOD-CHUCK, *ante*.

GROUND ICE, or ANCHOR ICE, a kind of ice of rare occurrence formed at the bottom of shallow streams.

GROUND-PINE, the popular name of the *lycopodium clavatum*, an evergreen vine sometimes three yards long. It is of the genus *ajuga*. Another species is the club-moss, a handsome little plant of tree-like form about 8 in. high.

GROUSSET, PASCIAL, b. Corsica 1845; became a journalist in Paris and wrote with Rochefort for the *Marseillaise*. He was always an extremely violent radical as was shown in his furious journal *La Bouche de Fer*. Under the insurrection in 1871 he was foreign minister of the central committee and held the same position in the commune. In June he was arrested in the disguise of a female. He was exiled to New Caledonia in 1872, and escaped two years afterwards.

GROVE, SIR WILLIAM ROBERT, b. England 1811; educated at Oxford. He began the practice of law, but left it for the study of electricity with which his name is associated in the powerful Grove battery. He was professor of experimental philosophy in the London institution, and a member of the council of the royal society. Returning to the law he became prominent in the South Wales and Chester circuits. He was knighted in 1872 when he was a justice of the common pleas. Afterwards he became judge of the high court of justice. He has published several works on subjects connected with electricity and electrical experiments, and an essay on *The Correlation of Physical Forces*, which has been translated into various European languages.

GROVER, CUVIER, b. Me., 1829; a graduate of the military academy. He served with credit on the union side in the war of the rebellion, attaining the rank of maj. gen. of volunteers. In the regular army he is a col. of cavalry.

GROVETON. See BULL RUN, SECOND BATTLE OF.

GROW, GALUSHA A.; b. Conn. 1823; graduated at Amherst college 1844, and entered upon the study of the law. He injured his health by over-study, and on being admitted to the bar in 1847, settled in the elevated regions of central Pennsylvania, where he became in 1850 state surveyor of wild lands. He was elected from Pennsylvania to each alternate congress from 1851 to 1863, and was speaker of the house of representatives 1861-63. He was a delegate to the Baltimore republican convention of 1864, which nominated Lincoln and Johnson. In 1875 he was out of politics, being president of a railway company, and residing in Houston, Tex. In 1878 he declined the nomination for congress, and the same year was a candidate for the nomination for governor of Pennsylvania, making a sharp contest, but being defeated by H. M. Hoyt. He continued prominent in politics in 1879-80, and at the present time (Dec., 1880) is prominent among the candidates for U. S. senator from Pennsylvania.

GRUBER, JOHANN GOTTFRIED, 1774-1851; b. Prussia; the author of a large number of works on imaginative, historical, and critical subjects, and with Ersch edited the *Allgemeine Encyclopädie der Wissenschaften und Künste*, made the most voluminous encyclopedia in any European language.

GRÜN, ANASTASUS. See AUERSPERG, A. A.

GRUNDTVIG, NICOLAI FREDRIK SEVERIN, 1783-1872; b. Denmark; educated at Copenhagen. He became a leader of the Danish party in the diet, favored a union of the Scandinavian kingdoms, and vigorously opposed German influence. He is best known by his books on *Northern Mythology*, a translation of *Saxo Grammaticus*, and some volumes of poetry.

GRUNDY, a co. in n.e. Illinois, on the Illinois river, and the Chicago and Alton, and Chicago, Rock Island and Pacific railroads; 432 sq. m.; pop. '80, 16,738. It has a level surface and fertile soil; chief productions: corn, oats, hay, and cattle. Co. seat, Morris.

GRUNDY, a co. in n.e. Iowa on the affluents of Red Cedar river; 500 sq. m.; pop. '80, 12,639. It has an undulating surface and a fertile soil, producing corn, wheat, oats, hay, etc.; Co. seat, Grundy Center.

GRUNDY, a co. in n. Missouri on Weldon river, crossed by the Chicago, Rock Island and Pacific railroad; 462 sq. m.; pop. '70, 10,567-115 colored. It has a prairie surface, and the soil is fertile; chief productions: wheat, corn, oats, butter, and wool. Co. seat, Trenton.

GRUNDY, a co. in middle Tennessee on the Rock and Elk rivers; 340 sq.m.; pop. '70, 3,250—137 colored. The surface is rough and mountainous, but the soil is fertile, producing wheat, corn, and cotton. Co. seat, Tracy City.

GRUNDY, FELIX, 1777—1840; b. Va.; educated for a physician but went into law practice. He was member of the state constitutional convention, of the legislature, and judge of the court of errors and appeals. About 1807 he was made chief-justice of Kentucky, but he almost immediately resigned and settled in Nashville. He was twice chosen a member of congress, and in 1829 became a senator and an active supporter of president Jackson. In 1838 he was appointed attorney-general of the United States.

GRUNER, WILHELM HEINRICH LUDWIG, b. Germany, 1801; studied in various countries, and became noted as an engraver. At the king's desire he produced for the Berlin museum a number of Raphael's cartoons from the originals at Hampton court. He had a share in the decoration of the London crystal palace, and in the decorations of Osborn castle and Buckingham palace. Among his works are "Fresco Decorations and Stuccos," Layard's "Nineveh," Raphael's "Caryatides from the Vatican," and "Bas Reliefs on the Façade of the Cathedral at Orvieto."

GRUS AND GRUIDÆ. See **CRANE**.

GRUTLI, or **RUTLI**, a small tract of meadow in Uri canton, Switzerland, about 5 m. s.w. of Schwytz, believed to be the place where in Nov., 1307, Arnold of Melchthal, Fürst, and Stauffacher planned the revolt against Austria which resulted in the independence of Switzerland. The tract was purchased in 1858 by the Swiss republic. Tell chapel is 3 m. distant from Grutli.

GUACA, or **HUACA**, a Peruvian word which the Spanish writer Herrera affirms means temple. Another writer takes it to be a name for the evil spirit. At the present time it is the name for the grave of an Indian. A little more than 20 years ago there was much excitement in Central America in consequence of the finding in these old tombs of small images of gold representing indigenous animals. The presence of the figures has been explained by the assumption that they were the handiwork of artificers who belonged to a race which inhabited the Pacific shores of America, at a period long anterior to that of the ancient Peruvians.

GUADALUPE, a co. in s. central Texas, on the Guadalupe river, crossed by the Galveston, Harrisburg, and San Antonio railroad; 750 sq.m.; pop. '70, 7,282—2,534 colored. A large part is yet covered with forests. The soil is fertile; chief productions: cotton, corn, cattle, and pork. Co. seat, Seguin.

GUADALUPE MOUNTAINS, between the Pecos and the Río Grande, in New Mexico and Texas, united on the n. to the Rocky mountains.

GUADIX, a city of Spain, in the province of Granada, on the n. slope of the Sierra Nevada and the river Guadix, 42 m. e.n.e. of Granada; pop. 10,154. It is said to have been the first bishop's see in Spain. It is inclosed by walls and contains the ruins of a Moorish castle and a cathedral. The Moors made strong defense here until 1489.

GUAICURÚS, Indians of Brazil, near the river and country of Paragnay. They are a hardy race, living mainly by raising cattle. They know little of agriculture, and subsist on fish and other animal food, and wild fruits. They have ranks of slaves, warrior, and a ruling caste. They have the hideous practice of deforming the under lip by inserting in it a piece of wood as large as the palm of a man's hand. The women are hardy, and assist in the chase and fishing.

GUÁLEYGUACHÚ, a city in the Argentine republic, on the river of the same name, 120 m. n. of Buenos Ayres, in the province of Entre-Ríos; pop. about 25,000. It stands on the right bank of the river, and is the center of export for the e. part of the province. A large trade is carried on in beef, hides, tallow, wood, and other animal products; and there are important salting and packing establishments in the vicinity, supplied by the vast herds and flocks of the region.

GUAM. See **GUAMAN**.

GUAMANGA. See **HUAMANGA**, *ante*.

GUANACACHE, a lake or lagoon of the Argentine republic between the provinces of San Juan and Mendoza. It is rather a series of shallow lakes filled with small islands.

GUANACASTE, a province of Costa Rica between the bay of Nicoya on the s. and lake Nicaragua on the n.; a rough and thinly populated country. Though given to Costa Rica on the formation of the republic of Central America, Nicaragua still claims that the province belongs to her.

GUANACO. See **HUANACA**, *ante*.

GUANCHES, the name of the inhabitants of the Canary islands found there by the early European discoverers, reported to have been uncommonly tall and well shaped, with straight, dark hair. Before the 16th c. closed they had all disappeared. It is not known where they came from, but some suppose them to have been Libyans driven from Africa by the Moors.

GUANO, a t. in the province of Chimborazo, Ecuador, 100 m. s.w. of Quito; pop., about 9,000. It has considerable manufactures of woollens, blankets, carpets, etc., and much Peruvian bark is exported.

GUANO ISLANDS. Besides the Chincha islands, on the coast of Peru, there are in the western Pacific numbers of low coral islands which are guano-producing. They are in lat. 3° and 4° s., and long. 155° and 174° west. They are frequented by the usual varieties of tropical birds, and afford large though decreasing quantities of the fertilizing deposit.

GUARA'NA, an article usually dissolved in water as a beverage, or mixed with food; used by the South American Indians. It is astringent and not unpleasant to the taste. It has been used also as a remedy for sick-headache, but although sometimes appearing to afford relief, its efficacy is doubtful. The article is made from the seeds of the *Puullinia sorbilis*, a Brazilian shrub of the order *sapindaceæ*. The dried seeds are reduced to powder, and mixed into a stiff paste and rolled into cylinders, which are then dried, forming a hard brownish mass. The essential crystallizable principle is said to be identical with caffeine, but has received the name of guaranine.

GUARANTY, in international law, is where a third nation or potentate guarantees that a party to an international agreement will fulfill its conditions. Such guaranty does not amount to surety, but is only a promise by a third party to use the best efforts to bring about the fulfillment of the agreement in question.

GUARATINGUETA, a t. in Brazil on the river Parahyba, 120 m. w. of Rio Janeiro; pop. estimated, 7,000.

GUARDIAN (*ante*), one who has lawful care and management of the person, or estate, or both, of an infant during its minority. A guardian by chancery in the United States resides in courts of equity and probate or surrogate courts. The father is guardian by nature, and after his death the mother takes his place. The mother of a bastard is the natural guardian. Guardians by statute are those appointed by deed or will, or those appointed by a court. Testamentary guardians, or those appointed in a will, supersede all others, and have full control of person and estate until the child arrives at full age. The great majority of guardians are appointed by courts, and their powers are regulated by statute or by common law. Where a mother is living the court need not appoint a guardian. At the age of 14 a minor has a right to choose a guardian, but for sufficient reason the court may disapprove the choice, and the person may then choose again. If a minor has a guardian appointed by a court he may, on arriving at the age of 14, choose another guardian with notice to the one first appointed. A wife may be a guardian, but must have the consent of her husband. The powers and liabilities of guardians (and of wards) are very closely defined by statutes and by the common law.

GUARDIAN ANGEL. This term has long been used to express the idea that human beings are under the special care and protection of certain angels. The notion is supposed to find authority in the words of Christ, Matt. xviii. 10; also in Heb. i. 14.

GUARNERI, or GUARNERIUS, a noted family of violin makers of Cremona, Italy. ANDREA, b. 1630, was a pupil of Nicolò Amati, whose work he to some extent imitated. GIUSEPPE, son of Andrea, was an imitator of Stradivarius. PIETRO, another of Andrea's sons, did work much inferior to that of his father. GIUSEPPE ANTONIO, b. 1683, a nephew of Andrea, was a pupil of Stradivarius, and the most celebrated of the Guarneri family. His work was variable, but when at his best, it is doubtful if he had a superior. He was, however, irregular in his life, trifling, and intemperate.

GUASTALLA, a walled t. in n. Italy in the duchy of Modena, the capital of a small district; pop. 10,618. It is on the river Po, 16 m. n. of Reggio; is a bishop's see, and has a cathedral and a public library. There are manufactures of silk.

GUATEMALA (*ante*). The physical features of Guatemala which are of the most practical interest, are its fine rivers, some of which are navigable to near their headwaters, and its lakes which furnish agreeable and salubrious sites for thriving villages. The geology of the country displays some mineral wealth, lead and coal being found in large quantities, while marble quarries and deposits of lithographic stone also are worked to some extent. There are but few animals in Guatemala that are dangerous to man, while it abounds with the usual tropical species, including monkeys, the tapir, the armadillo, honey-bear, etc., besides vast numbers of birds, many of them of brilliant plumage. There are said to be 36 species of humming-birds, 13 of woodpeckers, and 8 of trogons, including in the latter class, the *quetzal*, whose splendid yellow tail-feathers, 2 ft. in length, were used formerly as insignia by the Indian princes, and now form an emblematical figure in the arms of the republic. Alligators, snakes, salamanders, toads and frogs abound, and there is a rich development of insect life. The native products include more than 100 varieties of timber trees; cocoa is grown in the n.w.; there is some good tobacco raised, but in small quantities; and vanilla, aloes, rhubarb, ipecacuanha, castor-oil, and colocynth are all indigenous, and only need the intervention of foreign capital to become the material of a valuable export trade. Guatemala is divided into 20 departments, of which that of Guatemala proper is the most populous. Of the

entire population of 1,200,000, 720,000 are Indians, 300,000 Ladinos, and 180,000 whites. In 1874 the number of foreigners was only 829, of whom 191 were Mexicans, 164 Spaniards, 103 Frenchmen, 71 Italians, 64 Germans, and 50 Englishmen. The means of transportation and communication are very imperfect, 1,365 miles of road, with 432 bridges, and one unfinished railroad, and about 400 miles of telegraph being the entire service of this nature in 1874. Guatemala was, in ancient times, the seat of an extended and developed civilization, relics of which exist in numerous mounds, ruins, colossal heads, idols, pillars and altars. Until about 1824, when the Central American confederation was formed, Guatemala was under the Spanish rule. From 1827 to 1851 it was controlled by Honduras and San Salvador. In the latter year Carrera defeated the Hondurians and San Salvadorians at La Arada, and was rewarded by being made president of the republic, a dignity which was in 1854 extended to him for life: his death occurred in 1865, and he was succeeded by gen. Cerna, who was deposed in 1871. In 1872 gen. Bavrios was elected president, and four years later he endeavored to bring about the consolidation of the Central American republics. The effort failed, and a war ensued between Guatemala, Honduras and San Salvador, out of which Guatemala emerged victorious.

GUATEMOZIN, 1495-1525; son-in-law and nephew of Montezuma, and the last of the Aztec rulers of Mexico. He came to the throne in 1520 just as the Spanish invaders who had been repulsed by Montezuma were preparing another attack. April 28, 1521, the siege of the city of Mexico was begun, and the defenders suffered terrible tortures. The emperor was urged to escape, and tried to do so, but was captured. Cortes was at first disposed to be humane, but finally submitted to the clamor of his soldiers for plunder, and allowed the fallen emperor to be tortured by roasting his feet at a slow fire. He bore the infliction heroically, and the plunderers gained no information concerning the treasure they were after. The emperor was kept a prisoner and with that refinement of cruelty peculiar to the chivalrous Spaniard of the period, Cortes took him along in his raids to compel him to witness the outrages committed upon his people. Finally, on a charge of conspiracy to assassinate the Spanish leader (of which there was not a shadow of proof) Guatemozin and some others were executed.

GUATUSOS, a small tribe of Indians living along the Río Frio in Costa Rico, supposed by some to be legitimate descendants of the Aztecs, as they have fair complexions and reddish hair. They are extremely reserved, and no white men, not even the persistent Roman Catholic missionary, has explored their country.

GUAYAPE, a stream in Honduras, one of the affluents of the Patuca. For centuries the former stream has been famous for rich gold washings which the natives work in the rudest manner.

GUAYAS, a province of Ecuador on the Pacific ocean at the border of Peru; 11,502 sq.m.; pop. 75, 87,427. The soil is fertile with profuse natural vegetation. The climate is excessively hot.

GUAYMAS, a seaport in the state of Sonora, Mexico, on the gulf of California. The harbor is one of the best on the Mexican coast, but the town is otherwise unimportant, having a population of only a few hundreds. There is considerable foreign trade and exports of wheat, hides, etc.

GUELPH, the capital of Wellington, a province of Ontario, 48 m. by rail w. of Toronto on the Grand Trunk railroad; pop. 6,878. There is abundant water power from the river Speed, and a large number of manufactories.

GUEMAL, a species of deer on the e. coast of South America, by some persons called the "cloven-footed horse."

GUÉRANDE, a t. in the department of Loire-Inferieure, France, 47 m. n.w. of Nantes; pop. 6,749. There is an old castle in the place, and there are manufactures of some importance.

GUERET, a t. in the department of Creuse, France, 37 m. n.e. of Limoges; pop. 4,973. It has a college, hospital, lunatic asylum, and a normal school.

GUERICKE, HEINRICH ERNST FERDINAND, b. Prussia, 1803; a theologian, graduated at Halle, and was made professor there in 1829. He was opposed to the union of the Protestant churches in Prussia. He has published a *Manual of Church History*, *General Christian Symbols*, *Christian Archaeology*, *History of the Reformation*, *Review of Lutheran Theology*, and other works.

GUERIN, GEORGES MAURICE DE, 1810-39; a French poet, associate of Lamennais. His poems were collected in 1860 in *reliquie*. The poet was long taken care of by his sister Eugénie, a woman of remarkable genius, of devout life, and most agreeable style as a writer.

GUERNSEY, a co. in e. Ohio, intersected by the Marietta, Pittsburgh and Cleveland, and the Ohio Central railroads; 530 sq.m.; pop. 70, 23,838. The surface is moderately hilly, and much of it is covered with forests. Soil fertile; productions: cereals, hay, wool, butter, etc. Co. seat, Cambridge.

GUÉROULT, ADOLPHE, 1810-72; b. France; devoted his life to literature, and became a supporter of saint Simonism. He was consul at Mazatlan in 1842, and at Jassy in 1847; and five years afterwards was chosen chief of the *credit foncier*. He was the chief editor of the *L'Opinion Nationale*, a member of the *corps législatif*, and a strong opponent of ultramontaniam.

GUERRERO, a state in w. Mexico along the Pacific coast, between the sea and the Cordilleras: 24,550 sq. m.; pop. 320,069. The surface is rough and interspersed with mountain ridges. The valleys are fertile, and the vegetation is varied and profuse. Beans and corn are among the chief productions, the latter growing three crops in a year. Among other productions are cotton, sugar, coffee, and tobacco. Among the articles of export are cochineal, indigo, wool, and hides. The chief town and seaport is Acapulco, on the Pacific. Cotton and woollen goods are manufactured. A portion of the people are engaged in mining and a considerable number in the pearl fisheries.

GUERRERO, VICENTE, 1770-1831; b. Mexico; a mulatto and once a slave. In the Mexican war for independence he was an able and brave leader of the revolutionists. After the overthrow of the last emperor (Iturbide) he supported the republic. He ran against Pedraza for president in 1827, and was defeated, but two years afterwards when Pedraza resigned Guerrero seized the presidency. One of his first acts was to abolish slavery. When the Spanish invasion came in 1830, Guerrero was made dictator. He defeated the Spaniards, but soon afterwards his chief commanders Bastamante and Santa Anna revolted against him. A long contest followed which was ended by the betrayal of Guerrero to his enemies by a foreign ship captain who had invited him to dine on board his vessel. Guerrero was forthwith shot.

GUESS, GEORGE, or SEQUOYAH, 1770-1843; a half-breed Indian, the constructor of the alphabet adopted and still used by the Cherokee nation. He first made an alphabet of 85 characters, representing as many sounds, using as far as possible English letters. A part of the New Testament was printed in this alphabet. Guess went with his tribe from their old home in Georgia to the Indian territory. He died in Mexico.

GUEST, IN LAW. See INN AND INNKEEPER, *ante*.

GUGGENBUHL, LOUIS, 1816-63; b. Switzerland, and celebrated as a physician, particularly in the treatment of cretinism. He published several pamphlets and articles on the subject. A retreat for cretins was established by him, but given up after his death.

GUIB ANTELOPE, or HARNESSSED ANTELOPE, abounds in vast herds in w. Africa. Its sides are a dull red with white stripes which at a distance make it look as if wearing a harness.

GUIBERT, JACQUES ANTOINE HIPPOLITE, Count de, 1743-99; a French writer on military tactics. Frederick the great was rather prejudiced against the young writer, but on more intimate knowledge he greatly commended him. Guibert served in high positions in the French armies, and in 1789 he was member and reporter of the council of administration in the department of war. He retired from public life in 1789. His most important work is his *Essay on Tactics*.

GUICCIOLI, TERESA, Countess, 1801-73; the daughter of count Gamba; married when 16 to count Guiccioli who was over 60. She is known to fame from her intimate relations with Byron, the English poet with whom she was associated in 1819-22. Twenty-five years after Byron's death, in her 51st year, she married the marquis de Boschy.

GUIDO DE BRES, 1540-1567; b. at Mons. Persecuted for having left the church of Rome, he fled to London, joined the Walloon church, and entered the Protestant ministry. Returning to his native country, he labored earnestly as an evangelist in various parts of France. At the storming of Valenciennes by Noircarmes, Guido, in escaping, was caught, and after an imprisonment of seven weeks was hanged. The confession of faith which he prepared in 1559, and which was approved by Calvin, he published in 1562 as the *Confession of Faith of the Reformed Church in the Netherlands*.

GUIDO or SIENNA, a painter of the 13th c., about whose work there is much uncertainty. In the church of St. Domenico in Sienna is a large painting of the virgin and child enthroned, with six angels above, and in the Benedictine convent of the same city is a triangular pinnacle, once a portion of the same composition, representing the Savior in benediction, with two angels; the entire work was originally a triptych, but is not so now. The principal section of this picture has a rhymed Latin inscription giving the painter's name as Gu . . . o de Senis, with the date 1221; the genuineness of the inscription is not, however, free from doubt. In the general treatment of the picture there is nothing to distinguish it from other works of the same early period; but the head of the virgin and child are indisputably very superior, in natural character and graceful dignity, to anything to be found anterior to Cimabue. The best informed connoisseurship of recent years concludes that the heads are repainted, and are, as they now stand, due to some artist of the 14th c., perhaps Ugolino da Sienna; thus the claims of Cimabue would remain undisturbed. Beyond this little is known of Guido da Sienna. There is in the academy of Sienna a picture assigned to him, a half-figure of the virgin and

child, with two angels, dating probably between 1250 and 1300; also in the church of San Bernardino in the same city a Madonna dated 1262. Milanesi thinks that the work in San Domenico is due to Guido Graziani, of whom no other records remain earlier than 1278 when he was mentioned as the painter of a banner. [From *Encyc. Brit.*]

GUILFORD, a co. in n. North Carolina, on Deep river, crossed by the Richmond and Danville, and the North Carolina railroads; 650 sq. m.; pop. '70, 23,584—6,698 colored. The surface is undulating, and in some parts has good timber. Corn, oats, tobacco, and pork are the main products. Co. seat, Greensborough.

GUILFORD, a t. in New Haven co., Conn., on Long Island sound and the Shore Line railroad, 16 m. e. of New Haven; pop. 2,782. It has several churches, the Guilford institute, and some manufactures. Fitz-Greene Halleck, the poet, was born here.

GUILFORD COURT HOUSE, a small village in Guilford co., N. C. A battle was fought here Mar. 15, 1781, between the revolutionists under Greene, and the English under Cornwallis. It was not a decisive action, both parties suffering severely, and both declining to renew the attack.

GUILIM, JOHN, 1565–1621; an English writer on heraldry, educated at Oxford, a member of the college of arms in London. He published the *Display of Heraldry*, a work that passed through many editions.

GUINAND, FRANÇOIS, 1745–1825; an optician, native of Switzerland. He was the son of a carpenter, and when young made a telescope after one belonging to his employer, so exact a copy that it was not easy to distinguish one from the other. He then made lenses which attracted the notice of Fraunhofer, who at once gave him employment. Later in life he constructed many excellent telescopes.

GUISE, CHARLES DE LORRAINE, Duc de, 1571–1640; son of Henri and great-grandson of the first duke. He shared in the plots of the league against the duke of Mayenne; afterwards supported Henry IV. and became governor of Provence. After Henry's assassination he went over to the Medici party and was compelled to expatriate himself.

GUISE, LOUIS DE LORRAINE, Cardinal de, 1555–88. He was archbishop of Rheims, and in 1578 a cardinal. In the plots of the league he took a leading part whereby he made a bitter enemy of Henry II., by whose order he was assassinated.

GUISE, LOUIS DE LORRAINE, Cardinal de, 1580–1621; archbishop, and in 1615 a cardinal. He was more inclined to military than church life, and was sent to the Bastille for some connection with a duel.

GUISE, LOUIS JOSEPH DE LORRAINE, Duc de, 1630–71; succeeded to the dukedom in 1664. He was the husband of a daughter of Gaston, duke of Orleans. He died without issue, and the estate descended to the daughter of Charles, the fourth duke. She too died without children.

GUIZOT ELIZABETH CHARLOTTE PAULINE DE MEULAN, 1773–1827; wife of Guizot, the historian, and herself devoted to literature, from an early age. In 1801, she edited a literary journal. In 1807, in consequence of poor health, she accepted the aid of an unknown writer who soon became known to letters, and married her. This was François Pierre Guillaume Guizot, who was 14 years her junior. Her after life was employed in works designed for the intellectual improvement of young persons.

GUJERAT. See **GUZERAT**.

GUJRÁNWÁLA, a British district in the Punjab, India; 2,563 sq. m.; pop. '68, 550,576. It forms the central portion of the Rechna Doab, intermediate between the fertile submontane plains of Siálkot and the desert expanses of Jhang. On the northern frontier, a belt of alluvial land, from 2 to 6 m. in breadth, fringes the Chenáb throughout its course. The southern portion of the plateau has a rich soil, with accessible water; the villages here lie close together, while the people are industrious cultivators. But further s. the ground becomes harder and drier until in the extreme s. the *bar*, a flat expanse of barren land, passes slowly into the desert of Jhang. In the s.e. corner of the district the little river Degh irrigates and fertilizes a tiny valley of its own. Two or three minor watercourses are used for the purpose of irrigation in the villages through which they pass. The country is bare of trees, and the scenery throughout is tame and in the central plateau becomes very monotonous.

GULI, Sir WILLIAM WITBY, b. England 1816; graduated in medicine at London university; professor of physiology at the royal institution, and fellow of the royal college of physicians. He was for twenty years physician to Guy's hospital. In 1872 he was made a baronet. He is president of the clinical society, member of many other associations, and the author of several works on medical subjects.

GUMBO, a kind of soup, prepared from okra, and much in vogue in the southern states. It is made in various ways, sometimes containing considerable animal flesh, the most favorite being chicken. Gumbo soup proper, however, is composed principally of okra with portions of other vegetables added according to the taste, as rice or pearl-barley. The name is thought by some to have originated with the slaves, but that is doubtful. See **OKRA**.

GUNDULF, perhaps "a reformer before the reformation," in the 11th c. gathered disciples around him in the n. of France, particularly in Arras and Liege. He may have been an artisan who had settled in that region because of the flourishing condition of manufactures there, and among his fellow-workmen found or made disciples to his religious views. His greatest success was prior to 1025, in which year a company of his followers were arrested by Gerhard, bishop of Cambrai and Arras, and brought to trial for spreading heretical doctrines. According to the rules which they avowed they were persons who had forsaken the world, were striving to keep the flesh in subjection, to support themselves by their industry, to be honest in their dealings and to love all who were willing to join them. In their assemblies they were accustomed to pray and to wash one another's feet. But Gerhard, affirming that he had obtained from some of their proselytes a knowledge of their faith and practice, charged them with rejecting the Roman Catholic church, the pope's supremacy, the hierarchical system and even all clergy whatever; and with saying that "dogmatic, liturgic, and constitutive traditions are worthless; all the sacraments of the Roman Catholic church are to be rejected; the consecrated elements of the Lord's supper are nothing more than what they appear to our senses; at the last supper Christ did not really give his disciples his body for food and his blood for drink; marriage is to be avoided; church buildings are not holy, hence worship does not derive any special virtue from being offered therein; the altar is only a heap of stones; fumigations, and the ringing of bells are useless ceremonies; crosses, crucifixes, images tend to idolatry." But although Gerhard charged the followers of Gundulf with believing these doctrines, they would not avow them. They defended only their opinions concerning baptism, to show the inefficacy of which, as an outward rite, they pointed to the immoral lives of the clergy who administered, and of the people who received it, as well as to the fact that in the children baptized, not one of the conditions was to be found on which all efficacy must depend—no consciousness, no will, no faith, no confession. But at length, under the combined influence of the bishop's arguments and of torture, they agreed to recant their errors. Then Gerhard and other members of the synod pronounced a condemnation of the heresy, excommunicated the authors of it, if they did not repent, and compelled the prisoners to sign a statement of the true Roman Catholic doctrine before they were released. A copy of the proceedings was sent also to the bishop of Liege. The acts of the synod are the only source from which knowledge of this sect can be obtained; and after the trial neither Gundulf nor his followers can be traced. If they continued to hold their opinions they did so in secret. Similar sects existed at all times in the Roman Catholic church and, so far as the facts concerning them can be discovered, they seem generally to have been seekers after truth and godliness, in an age whose corruptions had dishonored the Christian name.

GUNTUR, or GUNTOOR, one of the districts in Hindustan on the w. side of the bay of Bengal, called the northern circars. It is between 15° and 17° n. and s. of the river Kistnah, which separates it from Masulipatam. It is the most southerly of the northern circars, and comprehends an area of about 3,500 sq.m.; exclusively of the mountainous district of the west. This district was the jaghire of Bassalut Jung, the brother of the nizam, when lord Clive obtained, in 1765, the northern circars from the Mogul, on which account he was allowed to retain it during his life; but after this it was to devolve to the company. It is a low, flat country, better calculated for growing rice than the more valuable grains. Its principal seaport is Mootapilly; and its chief town is Guntoor, the population of which is estimated at 20,000. The Guntoor territory now forms one of the districts under the Madras presidency, into which the northern circars were divided when the present Madras judicial and revenue system was established. Guntoor is the capital.

GURDÁSPUR, a British district in the Punjab, India, 1822 sq.m.; pop. '68, 906,126. The district occupies the submontane portion of the Bári Doáb, or tract between the Bias and the Ravi. An intrusive spur of the British dominions runs northward into the lower Himalayan ranges to include the mountain sanatorium of Dalhousie. This station crowns the most westerly shoulder of a magnificent snowy range, the Dháola Dhár, between which and the plain two minor ranges intervene. Below the hills stretches a picturesque and undulating plateau covered with abundant timber, made green by a copious rainfall, and watered by the streams of the Bári Doáb, which, diverted by dams and embankments, now empty their waters into the Bias directly, in order that their channels may not interfere with the Bári Doáb canal. The district contains several large and important *jhils* or swampy lakes. Few facts can now be recovered with regard to the early annals of Gurdáspur. Our first distinct historical knowledge began with the rise of the Sikh confederacy. The whole of the Punjab was then distributed to the chiefs who triumphed over the imperial governors. In the course of a few years, however, the famous Ranjít Singh acquired all the territory which those chiefs had held. Patháńkot and the neighboring villages in the plain, together with the whole hill portion of the district, formed part of the area ceded by the Sikhs to the East India company after the first Sikh war in 1846. In 1861-62, after receiving one or two additions, the district was brought into present shape, having its headquarters at Gurdáspur.

GURIEV, a t. and fortress in Russia on the Ural river, near its mouth, 188 m. n. of Astrakhan; pop. 2,838. The people are chiefly Cossacks, who have considerable business in manufactures and trade.

GURLEY, RALPH RANDOLPH, 1797-1872; b. Conn.; graduated at Yale, and became a preacher in Washington, under the Baltimore presbytery. He was for half a century agent for the American colonization society, visiting Africa three times in the interest of the colored people, and aiding in establishing the republic of Liberia. He made a great number of addresses and wrote many reports on the subjects of emancipation and colonization.

GURNEY, ELIZABETH. See FRY, ELIZABETH, *ante*.

GURNEY, Sir GOLDSWORTHY, 1793-1875; b. England, and known as an inventor. Among his discoveries and improvements are the magnesium, lime, and Bude lights. He claimed to have invented the oxyhydrogen blow-pipe, and to have been the earliest to produce those movements of the magnetic needle which led to the invention of the telegraph. He also first produced the high pressure steam jet.

GUROWSKI, ADAM, Count de, 1805-66; b. Poland. He was expatriated in 1818, and again the next year for revolutionary actions, but returned in 1825, and had a share in the insurrection of 1830. When that was over he went to Paris, joined the Polish committee, and was busy in political excitements. In 1835 he published *L'avenir sur la Russie*, a work advocating Panslavism which was so favorably thought of in Russia that he was recalled, though his confiscated estate was not restored. He was in the civil service of the empire, but left the country in consequence of a quarrel in 1844; passed some time in Switzerland, Germany, and Italy, and in 1849 came to the United States. He was for several years engaged in active literary work, and wrote occasionally for the *New York Tribune*. In 1861 he was employed in the state department at Washington. Besides his works written abroad he published in the United States, *Russia as it is*; *The Turkish Question*; *A Year of the War*; *America and Europe*; *Slavery in History*, and a diary of notes on the war of the rebellion.

GUSTAVUS ADOLPHUS SOCIETY, instituted among German Protestants in commemoration of the 200th anniversary of the death of Gustavus Adolphus, which occurred Nov. 16, 1632. Its object is to assist weak congregations of Protestant Christians in all parts of the world. It awakens much interest in Germany and has extended into the Netherlands and Sweden. Its annual income is \$150,000, with which it aids more than 900 congregations.

GUTHRIE, a co. in s.w. Iowa on branches of Raccoon river, and the Chicago, Rock Island and Pacific railroad; 576 sq.m.; pop. '80, 14,863. The surface is varied, and the soil fertile. Chief productions: wheat, corn, oats, and pork. Co. seat, Guthrie Center.

GUTHRIE, JAMES, LL.D., 1792-1869; b. Ky.; became prominent as a member of the bar; was several times elected to the legislature and presided over the state constitutional convention in 1850. In 1853 he was secretary of the treasury in the Pierce administration, and in 1865 was chosen U.S. senator, but on account of ill-health did not take his seat.

GUTTA-PERCHA. See CAOUTCHOUC.

GUTZKOW, KARL FERDINAND; 1811-78; b. Germany. He studied theology and philosophy, and published in 1831 *Forum der Journal literatureur*. In 1833 he published a novel entitled *Maha Gura*, the story of a god. Having associated himself with the journalist, W. Meuzel, at Stuttgart, the two authors produced *Novellen*; *Soireen*; and *Oeffentliche Charaktere*. He earned the reputation as the leader of "Young Germany" through his drama *Nero*, his preface to Schleiermacher's letters on Frederick von Schlegel, and his novel, *Wally, die Zweiflerin*, all of which were published in 1835. For the last named novel he suffered a three months' imprisonment at Mannheim, the tendency of his writings being considered detrimental to religion and social order. In 1847 he became the successor of Tieck as dramatist at the theater of Dresden, and from 1852 he edited a weekly journal at Frankfurt. In 1864 he attempted suicide while suffering from temporary insanity; and although after his recovery he continued to write as voluminously as formerly, his productions showed henceforth decided traces of failing powers. On account of a return of his nervous malady, Gutzkow, in 1873, made a journey to Italy, and on his return took up his residence near Heidelberg. Although some time before his death he had been confined to his sick chamber at Frankfurt, its occurrence in 1878 was due to accidental suffocation from smoke. He has won a great reputation, and is considered by many the foremost German novelist of his time. Among his numerous works are *Zur Philosophie der Geschichte*; *Blaséou*, a satirical tale; *Zopf und Schwerdt*, and *Urbild des Tartüffe*, two comedies; *Uriel Acosta*, a tragedy; *Die Ritter vom Geiste*; *Der Zauberer von Rom*; *Fritz Elvrod*, and many other novels.

GUY OF WARWICK, an old English metrical romance which is known to have existed in French as early as the end of the 13th century. Its authorship has been assigned to Walter of Exeter, a Franciscan monk, and, although this supposition has been generally disputed, Tanner regards it as probable. The romance has been

retouched by some French or Anglo-Norman minstrels, but is evidently of Saxon origin, and is allied to the story of Guido Tyrius in the *Gesta Romanorum*, and probably to the romance of *Sir Guy* quoted by Chaucer in his *Rime of Sir Topas*. The hero of this story is sir Guy of Warwick, who is said to have been the son of Siward, baron of Wallingford, to have married Felicia, the only daughter of Rohand, a famous Saxon warrior, to have become earl of Warwick in his wife's right, and after conquering Colbrand the Dane, to have lived as a hermit till his death in 929. The earliest English chronicler who mentions the story as historical is John Harding. Tanner is of the opinion that the first germ of romance dates from the battle of Brunanburgh, the "Vin-heide" of the *Egils saga*; but though the story has some basis in tradition, the chief events of the hero's life are plainly mythical.

GUYOT, ARNOLD HENRY, PH.D.; b. in Switzerland, 1807; educated at Neufchatel, Stuttgart, Carlsruhe, and the university of Berlin. At Carlsruhe was established the friendship with Agassiz, which influenced his whole subsequent career. He studied theology, but his natural taste and associations led him to devote himself to physical science. In 1835 he took the degree of PH.D. in the university of Berlin, and proceeded to Paris, where he spent five years in severe study, making scientific tours during the summers in France, Belgium, Holland, and Italy. His investigations at this time and subsequently, in relation to glaciers, were of great interest and importance. From 1839 to 1848 he was professor of history and physical geography in the academy or university of Neufchatel. In 1848 a political revolution broke up the academy, and Agassiz, who had already emigrated to the United States, induced Guyot to follow him thither. He resided for several years at Cambridge, Massachusetts. In the winter of 1848-9 he delivered a course of lectures in French, on *The Relations between Physical Geography and History*, at Boston, which was translated by prof. Felton, and published under the title of *The Earth and Man*. He was next employed by the Massachusetts board of education to instruct the teachers in normal schools and teachers' institute in the best method of teaching geography; and subsequently by the Smithsonian institution to investigate the physical structure and elevation of the Alleghany system of mountains. In 1855 he was appointed professor of physical geography in the college of New Jersey. Besides delivering courses of scientific lectures, and contributing to periodicals, he has published a series of geographical works, including *Primary Geography*, *Intermediate Geography*, and *Physical Geography*, with a set of large wall maps. With president Barnard of Columbia college, he edited Johnson's *Universal Cyclopædia*. Guyot was the first to show the precise height of Mt. Washington, of the Green mountains, and of the Black mountains in North Carolina. Among his works are *Cosmogony of the Bible*, *The Unity of the System of Life*, *the true Foundation of the Classification of Plants and Animals*, and *Man Primæval*, all in the form of lectures, but subsequently published.

GUYSBOROUGH, a co. in n.e. Nova Scotia bordering on the Atlantic; 1656 sq.m.; pop. '71, 16,555. The sea-coast is rough and barren, but there is some tillable land in the interior. Gold mining has been followed with some success, but the extensive fisheries are the main source of prosperity. The chief town has the same name.

GUYTON DE MORVEAU, LOUIS BERNARD, 1737-1816; b. France. When a youth he was made deputy attorney-general in the parliament of his native city (Dijon), but his inclination was to science, and he soon mastered enough of chemistry to take a professorship. In 1801 he made known the value of chlorine as a disinfectant. In 1782 he proposed a new chemical nomenclature which met the approval of Lavoisier and other learned scientists, and with their assistance brought it to the form which it still retains. For the *Encyclopædie Methodique* Guyton wrote a *Dictionary of Chemistry*. He was a member of the legislative assembly, and of the convention, where he voted for the execution of Louis XVI. From 1800 to 1814 he was at the head of the French mint, where he did much to promote the use of the decimal system.

GUZERÁT, a British district in the Punjab, India, 2,029 sq.m.; pop. '68, 616,347. It comprises a narrow wedge of sub-Himalayan plain country, possessing few natural advantages. From the basin of the Chenáb on the s., the general level rises rapidly towards the interior, which, owing to the distance of water beneath the surface, assumes a dreary and desert aspect. A range of low hills, known as the Pabbi, traverses the northern angle of Guzerát. They are composed of a friable tertiary sandstone and conglomerate totally destitute of vegetation, and presenting to the view a mere barren chaos of naked rock, deeply scored with precipitous ravines. Immediately below the Pabbi stretches a high plateau, terminating abruptly in precipitous bluff some 200 ft. in height. At the foot of this plateau is a plain, which forms the actual valley of Chenáb, and participates in the irrigation from the river bed. The district, as a whole, is well wooded, and great attention has been paid to arboriculture. Numerous relics of antiquity stud the surface of Guzerát district. Mounds of ancient construction yield numbers of early coins, and bricks are found whose size and type prove them to belong to the prehistoric period of Hindu architecture. A mound now occupied by the village of Moga or Mong has been identified as the site of Nisaea, the city built by Alexander the great on the field of his victory over Porus. The Delhi empire established its authority in this district under Bahloḥ Lodi, 1450-88. A century later it was visited by Akbar, who founded Guzerát as the seat of government. During the decay of the Mug

hal power, the Ghakkars of Rawal Pindi overran this portion of the Punjab, and established themselves in Guzerát about 1741. Meanwhile the Sikh power had been asserting itself in the eastern Punjab, and in 1765 the Ghakkar chief was defeated by Sardar Gújar Sinh, chief of the Bhangi confederacy. On his death his son succeeded him, but after a few months' warfare, in 1798 he submitted himself as vassal to the maharájá Ranjít Sinh. In 1864 Guzerát first came under the supervision of British officials. Two years later the district became the theater for the important engagements which decided the events of the second Sikh war. After several bloody battles in which the British were unsuccessful, the Sikh power was irretrievably broken at the engagement which took place at Guzerát on Feb. 22, 1849. The Punjab lay at the feet of the conquerors, and passed by annexation under British rule.

GWIN, WILLIAM McKENDRY, b. Tenn. 1805; educated at Transylvania university, and practiced medicine in Mississippi. He was a member of congress in 1841. In 1848 he went with the gold-hunters to California, and in 1850 came back as U. S. senator. Early in the war of the rebellion his disloyalty was so conspicuous that he was sent to prison. After the war he lived for a time in northern Mexico.

GWINNETT, a co. in n. Georgia, on the Chattahoochee river, intersected by the Atlantic and Richmond air line railroad; 530 sq.m.; pop. '80, 10,531—3,515 colored. The surface is rough and mostly covered with forests. Much of the soil is fertile, producing cotton, corn, wheat, etc. There are also mines of gold, antimony, and iron. Co seat, Lawrenceville.

GWINNETT, Burtox, 1732-77; b. England, and came to America in 1770. He became an extensive planter in Georgia, and was an early supporter of colonial rights. He was a member of congress, and president of the Georgia provincial council. In consequence of a quarrel about military matters he had a duel with gen. McIntosh, in which he was mortally wounded. Gwinnett was one of the signers of the declaration of independence.

GWYNN, or GWINN, ELEANOR, or NELL, 1650-90; a girl born in poverty, who sold fruit and flowers, and sang songs around the taverns and playhouses of London. About 1666 she went on the stage, and in light and humorous plays became one of the most successful actresses of the time. Having been mistress to Lord Buckhurst, she passed from him to Charles II., who had no scruple about acknowledging her, and she remained with him as long as he lived, keeping an establishment of her own, and having free admission to the best society. She was the only one of the king's favorites who remained true to him. A son of her's by the king became duke of St. Albans. After Charles's death she led a quiet and respectable life.

GYAROS, one of the Cyclades islands of the Grecian archipelago, 10 m. n.w. of Syra. It is about 5 by 3 m., and mountainous. It was once the residence of persons banished from Rome.

GYLLEMBOURG-EHRENSVÄRD, THOMASINE KRISTINE, baroness, 1773-1856, the most eminent female writer of Denmark. Her great beauty early attracted notice, and before she was seventeen she married the political writer Peter Andreas Heiberg. To him she bore a son, afterwards illustrious as a poet and critic, Johan Ludvig Heiberg. In 1800 her husband was exiled and she obtained a divorce, marrying, in 1801, the Swedish baron Ehrensvärd, himself a political fugitive. Her second husband, who presently adopted the name of Gyllembourg, died in 1815. In 1822 she followed her son to Kiel, where he was appointed professor, and in 1825 she returned with him to Copenhagen. In 1827 she first appeared as an author by publishing her romance of *The Polonius Family* in her son's newspaper, *The Flying Post*. In 1828 the same journal contained *The Magic Ring*, which was immediately followed by *An Everyday Story*. The success of this anonymous work was so great that the author adopted until the end of her career the name of *The Author of an Everyday Story*. From this time forward she took a foremost place among the writers of her time, but preserved her incognito with entire success. In 1833-34 she published three volumes of *Old and New Novels*. *New Stories* followed in 1835 and 1836. In 1839 appeared two novels, *Montanus the Younger* and *Rilda*; in 1840 *One in All*; in 1841 *Near and Far*; in 1843 *A Correspondence*; in 1844 *The Cross Ways*; in 1845 *Two Generations*. From 1849 to 1851 the baroness was engaged in bringing out a library edition of her collected works in 12 volumes. She died in her son's house at Copenhagen, and not until then did the secret of her authorship transpire; for throughout her life she had preserved the closest reticence on the subject, even with her nearest friends. The style of Mme. Ehrensvärd-Gyllembourg is clear and sparkling; for English readers no closer analogy can be found than between her and Mrs. Gaskell, and *Cranford* might well have been written by the witty Danish author. She introduced into the literature of her country a novel vein of realism and domestic humor, and, although she has had many imitators, she is still without a rival.

GYMNODONTES, Cuvier's genus of salt-water sun-fishes or globe-fishes (Linnean, genus *diodon*), belonging to sub-order (Cuvier's order) PLECTOGNATHI, of the order of TELEOST fishes, which also includes the living trunk fishes and file fishes. They are

noticeable for their resemblance to true ganoid fishes from their partly ossified endoskeleton and ganoid scales. See DIODON, *ante*.

GYMNONOTI. See GYMNOTUS, *ante*.

GYMNOSPERMS. See GYMNOGENS, *ante*.

GYNÆCEUM, the department for women in ancient Greek houses, where they were employed in various domestic occupations. It was always the innermost room. In Rome there was a gynæceum in which women were employed in making furniture and clothing for the imperial families.

GYRENCEPHALA, certain mammals including quadrumanous primates, carnivores, ungulates, proboscideans, cetaceans, etc., in which the superficies of the cerebrum lie in convolutions, and the cerebrum extends over more or less of the cerebellum, and over the olfactory nerves.

GYROVAGI, *wandering monks*. Monasticism, as it spread in the ancient church, took, almost immediately, the form of life in common in monasteries. Anthony, the chief originator of the institution, while for a long time he persistently sought a hermit's life for himself, found many seeking out his most lonely retreats and planting themselves near him, in order to imitate his example. At length, compelled to yield to their importunity, he induced them to live together, and to adopt rules, to some extent at least, for governing both their devotions and their work. Thus the rudiments of monasteries grew up in the remote mountain wilds. Many useful and beneficent consequences followed the increasing establishment of them through the deserts of Egypt and along the shores of the Euxine. A generous hospitality prevailed in them all. The traveler was welcomed and supplied with lodging and food. The Cœnobites of Egypt, especially, raised corn abundantly, and sent ship-loads of bread and clothing to the poor of Alexandria. But at the same time wild and ridiculous excesses grew naturally out of the system. Bands of roving devotees, known in different places by different names, infested whole districts of country from the Nile to the Black sea. Some of them, professing to practice continually mental prayer, were named *euchites*. Others, given to mystical dancing, were called *choroutes*, and a third class were *enthusiasts*, indulging in pretended spiritual communications. They abandoned all useful employments and all regular practice of devotion; although they professed to give themselves up to spiritual contemplations, which not unfrequently, through necessary reaction, degenerated into gross licentiousness. Similar wandering habits prevailed in connection with western monasteries, which were also, at first, centers and schools of useful industries of various kinds. Many monks, breaking away from conventual discipline, traveled from place to place and from convent to convent, entertained a short time at each, according to the generous hospitality practiced at them all, but evading all propositions to stay permanently at any. When they had gone round the whole circle they from necessity began again. From this feature of their history, some of them had the epithet *gyrovagi*—circulating vagabonds or tramps—fastened on them. Isidore of Seville extended the appellation also to the *circumcelliones* (q.v.); and it is equally appropriate to the whole tribe, the earliest as well as the latest, in the east as well as the west. They were all a great nuisance in the convents, carrying everywhere idleness and vice in their train. Augustine wrote strongly against them. Benedict made his rules with them specially in view. Columbanus condemned the monastic degeneracy which they had done so much to produce. But not until the time of Charlemagne were they effectually restrained. The later *mendicant* orders seem to be in some measure their successors.

GYTHIUM, a t. in ancient Achæa, on the Laconian gulf near the site of the modern port Marathonisi. It lay opposite the island Crane, at the foot of the fertile valley of the Gythius. On its coins the common types are Apollo and Heracles, the founders of the city. Heracles, the Phœnician god Melkart, points to an early connection with Tyre. The Phœnicians maintained a great trade with the shores of the Laconian gulf, and Aphrodite Migonitis, the Phœnician Astarte, had a temple at Migionium, the modern Marathonisi. Aphrodite and Asclepius also occur on its coins, and the latter had a temple in the city. A great port in the period of Phœnician intercourse, Gythium became a secondary town after the Dorian conquest, as is proved by the absence of early coins; and it is only after the decay of Sparta that it again becomes an important city. It was the ordinary station of the Spartan fleet, and was considered a port of Sparta, from which it was distant about 30 miles. In the wars against Athens it was therefore exposed to frequent attacks. Tolmidas, the Athenian commander, burned it 455 B.C. Later it was besieged unsuccessfully by Epaminondas, 370 B.C. It was strongly fortified by the tyrant Nabis; but he was compelled by Flamininus to give up Gythium and other coast towns to the Achæan league, 195 B.C. When, soon afterwards, the whole country became a Roman province, Gythium had its own magistrates. Augustus made it one of the twenty-four Eleuthero-Laonian towns. The existing ruins, called Paleopoli, are all of the Roman period. According to Strabo, it had an artificial harbor, of which no trace is now seen. In the town was a well sacred to Asclepius, and at three stades' distance was the stone Argos, where Orestes was relieved from his madness.

H

HABAKKUK, BOOK OF (*ante*), consists of two parts: I. *The Foretelling of the Chaldean invasion of Judea.* 1. The prophet complains of the prevalence of iniquity and violence among the Jews. 2. God replies, threatening to punish them by allowing the Chaldeans to come against them. 3. The prophet then humbly expostulates with God for using, as an instrument in punishing the Jews, a nation more guilty than they. 4. God again replies, promising that he will, at the right time, deliver his people, and will fill the earth with the knowledge of his glory. 5. The destruction of the Babylonian empire is foretold with attending judgments on the Chaldeans for their covetous exaltation of themselves on the ruin of others; their murderous violence in building up their cities; their enticement of men to drunkenness as a means for effecting their fall; and their extension of idolatrous worship. II. *The prophet's prayer followed by a sublime ascription of praise and declaration of continued trust.* 1. Prayer that God would give increased energy to his promised work of mercy that reaches through the ages. 2. Praise for his interposition in behalf of his people in Egypt, at the Red sea, and in the promised land. 3. Expression of confidence in him that, in times of utmost want and peril, he will give triumphant deliverance.

HABEAS CORPUS (*ante*), sometimes called "the great writ of personal liberty," is an inheritance of this country from England, and the grandest safeguard against despotism which jurisprudence affords. It is a writ of rights. Any person restrained of liberty from whatever cause is entitled to it upon petition under oath, and if his imprisonment is adjudged by a court having jurisdiction to be illegal, he will be set at liberty. The writ proceeds upon the assumption that every human being, unless he is either convicted or accused of crime and held for trial and punishment in due process of law, is entitled to freedom from bodily restraint. A court having power to issue the writ must issue it upon application in due form, and, after examination, must pronounce judgment upon the case before him. The person to whom the writ is addressed must come into court, bring his prisoner with him, and make disclosure of the grounds upon which he is held. Disobedience to the order of a court in such a case subjects the offender to severe punishment. The scope of the writ is very broad, even covering the case of a child who is restrained by one of its parents from intercourse with the other. In such a case the court will determine whether the parents have equal rights in the child, and if not, whether the father or mother is its lawful custodian. In the days of slavery the writ was often issued in behalf of slaves who had escaped from their masters, and when it was shown that the masters themselves had brought them into a state where slavery was unlawful, the court set them free. Chief-justice Shaw of Massachusetts was the first to avow and act upon this principle; but afterwards, in cases where slaves had run away from a state in which slavery was regarded as lawful, and the master had caused them to be arrested by the authority of the United States, he refused to interfere in their behalf. There were not wanting men eminent for legal learning who held that this writ, if it were only enforced in the spirit of the English law, as expounded by lord Mansfield in the celebrated Somerset case, brought to his attention by the pertinacity of Granville Sharp, would free every slave in the United States; it being held that slavery here had never been established by law, but was a usurpation from the beginning, and contrary to the genius of republican institutions. It was upon this principle, if not by this process precisely, that slavery was abolished in Massachusetts; and if the principle could have been made effective in all the states of the union, the slaves would have been emancipated peacefully and the country saved from the horrors of a desperate and bloody civil war. So important did the fathers deem the writ of *habeas corpus* that they inserted in the constitution of the United States (art. I., sec 9) an express provision that it should not be suspended "unless when in cases of rebellion or invasion the public safety may require it." The question whether the power to suspend is vested in congress or the president, or in each alike, has been much disputed. The power was exercised by the president during the late rebellion, with the tacit consent or express permission of congress. The power of the federal courts to issue the writ is limited in its scope by certain well understood principles, but that power, as far as it extends, is sovereign. No state court has a right to issue the writ for the discharge of a person held under the authority of the federal government. It cannot, for instance, discharge a soldier of the United States upon any pretense whatever, or inquire into the legality of the detention of a prisoner by the national authority. The national courts alone have jurisdiction in such cases. The proceedings upon a return of a writ may take place in chambers before a single judge or before several judges in open court, according to the terms of the writ itself.

HABERSHAM, a co. in n.e. Georgia, on the South Carolina border, on the headwaters of the Chattahoochee river; 450 sq.m.; pop. 70, 6,322—949 colored. The surface is rough. Iron, gold, rubies, and diamonds have been found. Corn and tobacco are the main products. Co. seat, Clarksville.

HABERSHAM, JOSEPH, 1751-1815; b. Geo.; lieut.col. in the revolution. He was for two terms speaker of the Georgia assembly, and in 1795 Washington made him postmaster-general.

HABINGTON, WILLIAM, 1605-45; son of Thomas, a leading Roman Catholic, to whose wife was attributed the exposure of the gunpowder plot. William was educated first at St. Omer, and refusing to become a Jesuit, was removed to Paris. On his return to England he fell in love with lady Lucy Herbert, second daughter of lord Powis, whom he celebrated under the poetical name of "Castara." After some opposition he won her hand, and they were married about 1632. In 1634 he published his famous volume of lyrical poems entitled *Castara*, which was reprinted in 1635 and 1640. In the latter year he also published a prose *History of King Edward IV.*, and *The Queen of Aragon*, a tragic-comedy. This play was published at the request of his kinsman, the earl of Pembroke; it was afterwards revived by Samuel Butler. The last work printed by Habington was *Observations upon History*, 1641. In 1647 his father died; and during the commonwealth, as we learn from Anthony Wood, the poet, "did run with the times, and was not unknown to Oliver the usurper." Habington possessed all the faults of his age except its impurity; he is honorably known as the chaste-test of the royalist lyrists. His genius was very fantastic, mild in its play of fancy, delicately ingenious, and of an unruffled stately dignity. He never rises to sublimity or passion, but is always refined and often extremely graceful.

HACHETTE, JEAN NICOLAS PIERRE, 1769-1834; a French mathematician. He became a deputy-professor at Mézières, and when the École Polytechnique was established, he was chosen on its staff, being appointed along with Monge over the department of descriptive geometry. There he instructed some of the ablest Frenchmen of the day, among them Poisson, Arago, and Fresnel. Accompanying Guyton de Morveau in his expedition, he was present at the battle of Fleurus, and entered Brussels with the French army. In 1816, on the accession of Louis XVIII., he was expelled from his chair by government, at the same time that his friend and fellow-worker Monge was removed from the institute. He retained, however, till his death the office of professor in the faculty of sciences in the École Normale, to which he had been appointed in 1810—the same year in which he married the daughter of the physician Maugras. The necessary royal assent was in 1823 refused to the election of Hachette to the academy of sciences, and it was not till 1831, after the revolution, that he obtained that well-merited honor. Hachette was held in high esteem for his private worth, as well as for his scientific attainments and great public service. His labors were chiefly in the field of descriptive geometry, with its application to the arts and mechanical engineering.

HÄCKEL, or HAECKEL, ERNST HEINRICH; b. Germany, 1834; studied botany and medicine, and has devoted much attention to biology. He is professor of zoology at Jena. He was among the first of German writers to agree with Darwin, and is one of the foremost leaders in that school of biologists. He has published several works on biological themes, in which he has advanced some interesting theories of his own.

HACKETT, HORATIO BALCH, D.D., LL.D., 1808-75; b. Mass.; studied theology at Andover and in Germany; was professor of Latin in Brown university of biblical literature in the Newton theological institution, and of New Testament Greek in Rochester theological seminary. Among his publications are a Chaldee grammar, a Hebrew grammar, *Commentary on Acts*; *Philemon* (with notes); *Christian Men in the War*; and several translations.

HACKETT, JAMES HENRY, 1800-71; b. New York; an actor who first appeared on the stage in 1826, and rapidly earned a prominent position, especially in eccentric parts. Among his impersonations best known were *Justice Woodcock*; *Sylvester Daggerwood*; *Mons. Morfeu*; *Dromio*; *Rip Van Winkle*; *Nimrod Wildfire*; *Sir Pertinax McSycophant*; and far beyond all others, *Falstaff*; in which he had no compeer. He played with much success in England, and in all parts of the United States. He was one of the lessees of the Astor place opera house at the time of the Forrest-Macready riot.

HACKETTSTOWN, a village in Warren co., N. J., on the Musconetcong river, and the Delaware, Lackawanna and Western railroad (Morris and Essex division). 52 m. w. of Newark; pop. 2,800. It is the seat of the centenary (Methodist) collegiate institution, and has a number of important manufactures.

HÄCKEL, or HÄCHEL. See **HECKLES**, *ante*.

HADAD, the name in Scripture of a Syrian deity. The divinity primarily denoted by the name is, according to Philo of Byblos, the king of gods, the greatest and highest, the sun. The Syrian kings of Damascus seem to have habitually assumed the title of Benhadad, or son of Hadad (three of this name are mentioned in Scripture), just as a series of Egyptian monarchs are known to have been accustomed to call themselves sons of Ammon-Ra. The word Hadadrimmon, for which the inferior reading Hadarrimmon is found in some MSS., in the phrase "the mourning of (or at) Hadadrimmon," has been a subject of much discussion. According to Jerome and all the older Christian interpreters, the mourning for what occurred at a place called Hadadrimmon (Maximianopolis) in the valley of Megiddo is meant, the event alluded to is generally held to be the death of Josiah; but since Hitzig and Movers the opinion has been gaining ground

that Hadadrinmon is merely another name for Adonis or Thammuz, the autumn sun-god, the allusion being to the mournings by which the Adonis festivals were usually accompanied.

HADDOCK, NORWAY, an ocean fish of the mailed-cheek kind or family; from 12 to 24 in. long; the body and the upper side of the head covered with stiff scales. It is of a bright red color when living, but after death turns partially white. It is often called the snapper, rose fish, or red perch. It is abundant off Newfoundland. Greenlanders make needles of its spines.

HADDOCK, CHARLES BRICKETT, D.D., 1796—1861; b. N. H.; graduated at Dartmouth and studied theology at Andover. He was prof. of rhetoric and *belles-lettres* in Dartmouth for 19 years, and of intellectual philosophy and political economy for 16 years. In 1850 he was U. S. minister at Lisbon. He was several times chosen to the New Hampshire legislature and was the chief promoter of the common school system of the state. He was equally prominent in advancing railroads. Many of his addresses and reports have been published.

HADJI. See **HAJJ**, *ante*.

HADES (*ante*), a Greek word signifying literally *unseen*, was employed by the classic writers to denote the region of the dead which, as they believed, was in part the wretched prison of the wicked, and in part the elysian abode of the blessed. In the Greek translation of the Old Testament it is used as the equivalent of the Hebrew *sheol* which denotes the region of departed spirits, sometimes without referring to any separation between the righteous and the wicked; and at other times marking the separation clearly. While the Greeks and the Jews were so far agreed concerning the abode of the dead, there was one great difference between them. The former had no hope of deliverance from *hades* as they had no faith in a resurrection. But among the Jews the expectation of a resurrection was the chief comfort in connection with death. The ancient believers, it is said, looked for a heavenly country and for the city which God had prepared. The Psalmist said, in his expression of confidence in God, "Thou shalt guide me by thy counsel and afterwards receive me to glory." The prophecies of Isaiah, Hosea, and Daniel, contain promises of a resurrection. These and similar declarations gave the Jews a hope concerning the future state, that heathen nations did not possess. In the New Testament the Savior's use of the term is of paramount importance. On one occasion, in declaring the consequences that would follow Capernaum's neglect of its privileges, he contrasted *hades* with *heaven*. At another time, with reference to the welfare of his church, he promised that the gates of *hades* should not prevail against it. In the parable of the rich man and Lazarus he represents the former as tormented after death, in *hades*, and the latter as happy in the society of the blest, a great gulf being fixed between the two. After his ascension to heaven, appearing in vision to the apostle John, he affirmed that he himself had the keys of *hades* and of death; and revealed to him the casting of them both into the lake of fire. To the question, Was Christ in *hades* during the interval between his death and resurrection? some reply, 1. That the apostle Peter taught that he was, in applying to him Psalm xvi, "Thou wilt not leave my soul in *hades*, neither wilt thou suffer thine holy one to see corruption." This implies (they say) that, for a time, his soul was in *hades* but returned from it before his body was in any degree changed. The answer to this is that the apostle quoted the Greek translation which conveys the general meaning but will not bear any emphasizing of the preposition "in." The Hebrew original, "Thou wilt not forsake or abandon my soul to *sheol*," clearly expresses the idea that his soul would not even enter it. 2. The same apostle is appealed to again as confirming the construction put on his quotation by teaching in his first epistle that Christ went and preached to the spirits in prison, that is in *hades*. To this the answer is that though the spirits referred to were in prison when the apostle wrote, Christ's preaching to them had been before his incarnation during the divine forbearance in the days of Noah. 3. The apostles' creed (it is said), declares that Christ, after his death, descended into *hades*. To this the answer is that the creed, with all its excellences, is not known to be the work of apostles; and that, while all the rest of it can be traced back at least to the 2d century, the clause, "he descended into *hades*," was not in it even at the beginning of the 5th, (nor has the Nicene creed, adopted 325 A. D., any such clause). Therefore, as it was added at so late a period when erroneous views of various sorts had become common, the clause has no claim to be believed merely because it is in the creed. Our knowledge concerning the place in which the human soul of Christ rested during the period referred to, is limited by his promise to the penitent thief, "This day shalt thou be with me in *paradise*;" and by his subsequent invocation to the Father, "Into *thy hands* I commend my spirit." Besides the use of the word *hades* by the Savior and with reference to him, it occurs in the New Testament only in Paul's apostrophe, "O grave, where is thy sting? O *hades*, where thy victory?"

HADLEY, a village in Hampden co., Mass., on the Connecticut river, 18 m. n. of Springfield; pop. township, 2,125. This ancient village is the seat of the Hopkins academy, and has considerable manufacturing industry. It is in the midst of charming meadow scenery fringed with mountains.

HADLEY, JAMES, 1821-72; b. New York. An accident in boyhood made him hopelessly lame, and gave him an impulse of study, and he soon became distinguished in his knowledge of ancient languages. He graduated at Yale, first in his class, and was tutor in Middlebury college and afterwards at Yale. He passed through the theological course at New Haven, but did not enter the ministry, becoming assistant professor of Greek in Yale college in 1848, and in 1851 professor, and continuing in that chair till his death. He was very efficient personally as a teacher, and was also one of the most eminent linguists of his time, being familiar with Sanskrit, Hebrew, Greek, Latin, Arabic, Gothic, Armenian, and several modern languages, including Welsh and Swedish, and early forms of English. He was the author of the *History of the English Language* in the introduction to Webster's dictionary. He was an able student of comparative philology, and vice-president of the American philological association. He was also a member, and in 1871-72 president of the American oriental society. He was a member of the American committee for the revision of the English version of the New Testament, and wrote the article on the *Language of the New* in Smith's *Dictionary of the Bible*. He also wrote an essay on the Greek accent which was republished in Curtius's *Studien zur griechischen und lateinischen Grammatik*. He published *Lectures on Roman Law*, *Elements of the Greek Language*, and a Greek grammar very widely used; and after his death a volume of his writings, entitled *Essays Philological and Critical*, was edited by prof. W. D. Whitney.

HADRAMAUT, a large district of Arabia, next to Yemen, lying along the Indian ocean 1200 m. from Aden to cape Ras-el-Hadd. This coast has been visited and partially explored by capt. Wellsted and other navigators. It presents everywhere much the same dreary appearance as that of the Hejaz and Tehamah—a narrow fringe of sand or of equally sterile shore; beyond this rises a mountain range, varying, so far as any tolerably accurate calculations have been made, from 1000 to 3,000 ft. in height; its formation appearing to be in many places volcanic. Behind this comes a second and loftier mountain belt, Jurassic in its general character, resembling the highlands of Yemen; while far beyond stretches away the great sandy desert, varied, however, where it approaches the mountain-foot, by oases of considerable fertility, among which that of Wadi Doan is said to be the most extensive. Several barren islands and reefs fringe the waste. The mountains of Hadramaut form one system with those of Yemen, but, unlike the latter, seem to be of an almost monotonous sterility. Torrents descend from them, but no rivers; nor though lakes are mentioned in the very apocryphal records of the Arabs, has any signs of their existence been verified. The climate is intensely hot, and said to be unhealthy, at least to strangers. Vegetation is scanty. No part of the peninsula has been less explored than this, even by the orientals themselves; and European travelers have supplied few reliable data for what regards the physical characteristics of the interior, any more than its inhabitants and products.

HADRIAN, WALL OF. See **ROMAN WALL**.

HADROSAURUS, a genus of extinct gigantic reptiles of the order DINOSAURIA (q. v.) according to the classification of Huxley. The general characteristics of the *dinosaurus* are: they were sometimes naked, but were usually covered with a well-developed exo-skeleton, consisting of bony shields resembling those of the crocodile; anterior trunk ribs, double headed; teeth confined to the jaws, and implanted in distinct sockets; always two pairs of limbs, strong, and furnished with claws; but the most remarkable feature in their organization was the structure of the pelvis and hind limb, which approximated to that of the same parts in birds. All the genera of the order DINOSAURIA belong exclusively to mesozoic time, ranging from the triassic to the cretaceous periods, but particularly abounding in the oölitic, and lower and middle cretaceous epochs. The number of dinosaurian reptiles was very large, and represented by many genera, among which, beside hadrosaurus, are the *iguodon* (q. v.), *cionodon*, *chontrosaurus*, *ctiosaurus*, *laosaurus*, *megalosaurus* (q. v.), and *titanosaurus* (q. v.). Hadrosaurus much resembled the *iguodon*, but was rather smaller, the largest species being about 30 ft. long, while the *iguodon* was probably over 40 feet. Like the *iguodon*, the hadrosaurus fed upon vegetable substances, such as shrubs, leaves, etc. Among the species may be mentioned *hadrosaurus foulkii*, from New Jersey, about 28 ft. long; *hadrosaurus minor*, about half as long; and *hadrosaurus agilis*, from Kansas (Marsh).

HADRUMETUM, a city on the African coast of the Mediterranean on the gulf of Hammamet. A Phœnician colony of earlier date than Carthage, in course of time it became subservient to the imperial city, and fell along with it under the power of the Romans. On the subdivision of the Roman province of Africa Propria, it became the capital of Byzacium. By Trajan it was made a colony, as is evinced by the grandiloquent inscriptions preserved by Gruter—*Col. Concordia Ulpia Trajana Augusta Frugifera Hadrumetina*. From the devastation inflicted by the Vandals, it was restored by Justinian, and in consequence it bore for some time the name of Justinianopolis.

HAECKEL. See **HÄCKEL**.

HÆMA—in compound words. See **HEMA**—in compound words.

HÆMO—in compound words. See **HEMO**—in compound words.

HAGENAU. See HAGUENAU, *ante*.

HAG-FISH, GLUTINOUS HAG, or BOREZ, a marine fish which forms with the lampreys one of the lowest orders of vertebrates. Similar in form to a lamprey, it is usually found within the body of dead cod or haddock, on the flesh of which it feeds after having buried itself in the abdomen. When caught, it secretes a thick glutinous slime in such quantities that it is commonly believed to have the power of converting water into glue. It is occasionally found in the north Atlantic and other temperate seas.

HAGGAI, BOOK OF, (*ante*) consists of four messages—portions of which were prophetic—delivered about 18 years after the return of the first part of the Jews from captivity. I. *On the first day of the sixth month of Darius's second year.* 1. Remonstrance against the refusal of the people to build the house of the Lord, and against their selfish devotedness to the adornment of their own houses. These facts declared to be the cause of the disappointments they had suffered in their harvests, food, clothing and income. 2. Exhortation to consider what their cause had been, and to reverse it by completing the temple; accompanied by the promise that the Lord, taking pleasure in their work, would use it for his glory; and followed by a renewed declaration that all the failure of their agricultural pursuits was on account of their neglect of the temple in their eagerness to enjoy their own houses. 3. Record of the obedience of the governor, high-priest, and people to the word of the Lord, of the divine co-operation with them, and their consequent zeal in re-entering on the required work. This practical result was reached within 24 days from Haggai's first message. II. *Within a month from that time* a second message was sent exhorting rulers, priests, and people to continued courage and zeal, and appealing specially to the old men who, having seen the first house in its glory, were now disheartened by the apparent insignificance of the second. All were assured that, in a little while, after great overturnings of governments and violent commotions among the nations, the desire of all nations would come, filling the second temple with greater glory than the first had ever known, and giving peace to men. III. *Three months* after the re-commencement of the work a third message was sent illustrating by emblems taken from the ceremonial law, the sinfulness of the people and the consequent impurity of their work, yet pledging to them that the gracious blessing of God should, from that day forward, be as conspicuous in their history as his judgments had already been. IV. *On the same day* the fourth message—addressed personally to Zerubbabel as the son of David and representing the Messiah who would descend from him—predicted again great wars and consequent overturning of kingdoms which would change the political aspect of the world, and in connection with which the Messiah would be made conspicuous as the signet of the Lord.

HAGNER, PETER, 1772-1850; b. Penn. Washington gave him a clerkship in the treasury department in 1793, and he served in that department in various responsible positions 56 years, resigning finally in 1849. For a large part of the time he was third auditor.

HAGUE, WILLIAM, D.D., b. New York, 1805; graduated from Hamilton college, and was at various periods the pastor of Baptist churches in Boston, Providence, Albany, Chicago, Newark (N. J.), and Orange (N. J.). He has published *The Baptist Church Transplanted from the Old World to the New; Home Life; Christianity and Statecraft*, and various discourses.

HA HA BAY, an expansion of the Saguenay river, 7 m. long, 1 m. wide, and 60 m. from its mouth in the St. Lawrence. It is in the center of some magnificent scenery, and is a great attraction for summer tourists. The upper part of the bay displays undulating meadow-land, on whose shores are the two little villages of St. Alphonse and St. Alexis, both together containing not more than 500 inhabitants. This bay received its name from the impression which its charming scenery made upon the minds of the early French *voyageurs*, in contrast with that of the gloom and solitude of the lower river.

HAHN, AUGUST, 1792-1863; a German Protestant theologian; studied at Leipsic, and in 1819 was nominated professor extraordinary of theology at Königsberg, and in the following year received a pastoral charge and a superintendency in that city. These posts, however, he resigned on his promotion in 1821 to be professor ordinarius. In 1826 he removed as professor of theology to Leipsic, where, hitherto distinguished only as an editor of *Bardesanes, Marcion and Ephraen Syrus*, he came into extraordinary prominence as the author of a treatise, *De rationalismi qui dicitur vera inde et qua cum naturalismo contineatur ratione*, and also of an *Offene Erklärung an die Evangelische Kirche zunächst in Sachsen u. Preussen*, in which he endeavored to convince the rationalists that it was their duty voluntarily and at once to withdraw from the national church. In 1833 Hahn was called to Breslau as the theological professor and consistorial councillor, and in 1844 he became general superintendent of the province of Silesia. Among the other literary labors by which he is best known are his edition of the Hebrew Bible and his *Bibliothek der Symbole und Glaubensregeln der apostolisch-katholischen Kirche*.

HAICRITES, the name given to a Mussulman sect, which attempted to amalgamate their own and the Christian religion, and anticipated the second coming of Christ to judge the world, because the Koran says: "Oh Mohammed, thou shalt see thy Lord coming in the clouds."

HAIGHT, BENJAMIN L., S.T.D., LL.D., 1809-80; b. New York; graduated at Columbia college and the general theological seminary in New York. He was ordained in that year and chosen rector of St. Peter's (Prot. Epis.) church. In 1834 he went to Cincinnati, and was three years rector of St. Paul's. In 1837 he was called to All Saints, church, New York, remaining there until 1846. He was for 18 years professor of pastoral theology and pulpit oratory in the general theological seminary. In 1855 he was sent to Trinity parish, and in 1874 was chosen assistant rector. He has been a delegate in three general conventions. In 1873 he was chosen bishop of Massachusetts, but ill health compelled him to decline the office. For 20 years he was secretary of the diocese of New York, and in the meantime held various other honorable offices, among them that of trustee of Columbia college.

HAILES, LORD. See DALRYMPLE, Sir DAVID, *ante*.

HAINAN (*ante*), forms a *foo* or department of the Kwang-tung, though strictly only a portion of the island, is under Chinese administration, the remainder being still unsubjugated. The capital, Kiung-chow-foo, situated in the n. some 10 *li* (3 m.) from the coast, is well-built and compact, with a pop. which has been over-estimated at 200,000, but C. C. Stuhlmann in the *Globus*, 1876, gives the correct figure as 100,000. The principal industrial products of the capital are carved articles in cocoa nut and scented woods. In 1630 it was the seat of a Roman Catholic mission, under Benoit de Mathos, a Portuguese Jesuit, and the old cemetery contains about 113 Christian graves. The port of Kiung-chow-foo at the mouth of the river is nearly dry at low water, and is called simply *hoi hoi*, i.e., seaport.

The two towns are united by a good road, along which a large traffic is maintained. The net value of the trade of the port, that is the foreign and native imports, less the re-exports and native imports of local origin, rose from 684,772 taels in 1873 to 1,215,056 in 1878. Out of 182 vessels engaged in the foreign trade in 1878, with a tonnage of 87,290 tons, 152 were British, with a tonnage of 70,078 tons. The exports comprise leather, hides, skins, tallow, sugar, to the value of 204,427 taels; hemp, galangal, lunggan pulps, grass, cloth, and silk and sesamum, to the value of 41,936 taels. The pop. of the entire island is estimated at 2,500,000. At its first conquest 23,000 families were introduced from the mainland. In 1300 the Chinese assign it 166,257 inhabitants; in 1370, 291,000; in 1617, 250,524, and in 1835, 1,350,000.

HAIRBELL. See HAREBELL, *ante*.

HAIR-WORM. See GORDIUS, *ante*.

HAJIPUR, a t. in Bengal on the Gandak near its confluence with the Ganges, said to have been founded about 500 years ago by Haji Ilyas, the supposed ramparts of whose fort are still visible. Hajipur figures conspicuously in the history of the struggles between Akbar and his rebellious Afghan governors of Bengal, having been twice besieged and captured by the imperial troops, in 1572 and again in 1574. Its command of water traffic in three directions makes the town a place of considerable commercial importance. Within the limits of the old fort is a small stone mosque, very plain, but of peculiar architecture, and attributed to Haji Ilyas. Two other mosques and a small Hindu and Buddhist temple are in the town or its immediate vicinity. Beside the ordinary courts, the town contains a school, post-office, charitable dispensary, and distillery. Pop. 72, 22,306.

HALBIG, JOHANN, b. Bavaria 1814; a sculptor educated in the Munich academy and professor of statuary in that institution. Since 1846 he has modeled more than 1,000 works, chiefly busts. The most notable are the lions at the gate of victory, Munich; a group of figures representing the states of the German empire in the hall of independence in Kelheim; *Christ on the Cross*, in Munich, and an allegorical group, *North America*, for a citizen of New York. In 1873 the king of Bavaria directed him to make a colossal group representing the crucifixion, to be placed on a mountain near Oberammergau.

HALDANE, JAMES ALEXANDER, 1768-1851; a brother of Robert, and, like him, passionately fond of a seaman's life. In 1793 he became the commander of the *Melville Castle*, but before the ship sailed a radical change took place in his religious character. Resolving to imitate his brother's example he sold his command for £9,000, and his interest in the ship and stores for £6,000, and with this fund of £15,000 retired with his wife to Scotland, giving his chief attention to religious concerns. Having obtained personal peace of mind, he spent much time in devising and prosecuting plans of usefulness. He organized many Sabbath schools, and preached extensively in the villages and large towns of Scotland. In company with John Campbell, the African traveler, he itinerated through the land as far as Orkney, and as congregations were gathered by their labors they were provided with houses of worship by the liberality of his brother Robert. He finally became the stated pastor of Leith-Walk tabernacle, Edinburgh, and for 50 years performed there, without salary, all the duties of a minister. He also wrote and published: *Social Worship of the first Christians; Man's Responsibility and the Extent of the Atonement; Exposition of Galatians; Inspiration of the Scriptures*.

HALDANE, ROBERT, 1764-1842; an eminent philanthropist of Scotch descent, b. in London. He inherited a large property, but, having a passion for the sea, entered the

navy, where he served with honor, 1780-83. When the French revolution commenced he regarded it with pleasure and hope, but was soon disappointed by its excesses. Having, after a season of doubt, become convinced of the divine origin of Christianity he heartily embraced it, and resolved to devote his life and fortune to its advancement. Selecting India as a field for missionary operations, he engaged the co-operation of several ministers to whom he pledged a sufficient support; but as the East India company refused to sanction the enterprise it had to be given up. He then resolved to work at home, sold his estate for 70,000 guineas, which he invested in the public funds, and, limiting himself and family to £500 per annum, devoted the remaining £5,500 of the income to the prosecution of his religious work. In company with Rowland Hill and other zealous men, he was very successful in awakening throughout Scotland a deep interest on the subject of religion. But the unusual methods of work which they adopted, excited the opposition of the Scottish general assembly. Field preaching was forbidden, and other features of the revival were disapproved. Finding it impossible to submit to such restraint, Mr. Haldane seceded from the established church, and at his own cost erected tabernacles for public worship in many of the large towns of Scotland. At his expense, also, 300 young men were educated for the ministry under several eminent teachers. He established a theological seminary in Paris, and engaged in personal labors in promoting religion in the s. of France and in Switzerland. By his work in Geneva, a new impulse was given to evangelical Christianity, and an important theological school was established. His attention was directed also to missionary work in Africa, and as a beginning he had 30 children brought to England from Sierra Leone to be educated, giving a bond for £7,000 to meet their expenses. From this, however, he was relieved by friends of the cause in London. Besides accomplishing so much by gifts of money, and by personal labor in preaching and itinerating, he wrote several practical works, among which are: *The Evidence and Authority of Divine Revelation: Verbal Inspiration; An Exposition of the Epistle to the Romans*.

HALDEMAN, SAMUEL STEHMAN, b. Penn., 1812; educated at Dickinson college; in 1836 assistant in the geological survey of New Jersey, and the next year in the same service in Pennsylvania. In the university of Pennsylvania he was professor of natural history in 1851, and at a later period in the same capacity in Delaware college; then till his death professor of comparative philology in the Pennsylvania university. Some years ago he discovered the oldest fossil stone known up to that period. He has published many special papers on scientific themes, and in 1858 he issued *Analytical Orthography*. He died in 1880.

HALDIMAND, a co. in the province of Ontario, Canada, near the e. end of lake Ontario, intersected by the Grand Trunk, the Great Western, the Canada Southern and the Hamilton and Lake Erie railroads; 475 sq.m.; pop. '71, 24,851. Seat of justice, Cayuga.

HALE, a co. in w. Alabama, on the Black Warrior river, crossed by the Alabama and Chattanooga railroad; 600 sq.m.; pop. '70, 21,792-16,990 colored. The surface is undulating, and a large portion is covered with forests, soil fertile, producing cotton, corn, etc. Co. seat, Greensborough.

HALE, BENJAMIN, D.D., 1797-1863; b. Mass.; graduated at Bowdoin college, and became principal of Saco academy. He studied theology at Andover, was a Congregational minister in 1822, and the next year a tutor in Bowdoin college; afterwards professor of chemistry and mineralogy at Dartmouth. From 1836 to 1858 he was president of Geneva (N. Y.) college. While at Dartmouth he took orders in the Protestant Episcopal church. He published *Introduction to the Mechanical Principles of Carpentry; Scriptural Illustrations of the Liturgy*, and sermons and addresses.

HALE, DAVID, 1791-1849; b. Conn. When young he taught school in Boston; in 1815 went into business, but failed; in 1827 settled in New York and became one of the editors of the *Journal of Commerce*, and subsequently one of the chief proprietors. He was an advocate of free trade. He was noted for liberality and benevolence in religious enterprises, and himself purchased the building known as the Broadway Tabernacle, and established there an orthodox Congregationalist church.

HALE, EDWARD EVERETT, b. Boston, 1822; graduated at Harvard in 1839, and in 1846 became pastor of a Unitarian church in Worcester, Mass., whence he went to the south Congregational (Unitarian) church, Boston. Among his works are *The Rosary; Sketches of Christian History; Kansas and Nebraska; Letters on Irish Emigration; Ninety Days' Worth of Europe; Sybaris and Other Homes; How to Do it; Ingham Papers; Reformation; Lancelotti, and other Stories; Ups and Downs; Christmas Eve and Christmas Day; In His Name; Our New Crusade; Workingmen's Homes*. In addition to these he edited an edition of Lingard's *History of England*; was editor of the *Christian Examiner*, organ of the Unitarian body, and founded *Old and New*, a monthly magazine whereof he was the sole editor.

HALE, EUGENE, b. Me., 1836; studied law, and was admitted to practice in 1857. For 9 years he was attorney for Hancock county. In 1867-68 he was a member of the legislature; in the latter year he was elected to congress, and was four times afterwards

re-chosen, serving 10 years in all. He has long been prominent as a leader of the republican party.

HALE, JOHN PARKER, b. N. H., 1806; d. 1873; a statesman. He graduated at Bowdoin college in 1827, and settled at Dover, which was his home for the rest of his life. He was admitted to the bar in 1830, represented the town in the state legislature in 1832, and in 1834 he received from president Jackson the appointment of U. S. attorney for the district of New Hampshire. He held the office until 1841, when he was removed by president Tyler. In 1843 he was elected to congress as a democrat to fill a vacancy. In 1844 he was nominated by his party for re-election, in spite of his well-known opposition to the extension of slavery. The New Hampshire legislature in the summer of 1844, having passed a resolution instructing the members of congress from that state to vote for the annexation of Texas, Mr. Hale addressed a letter to his constituents in which he declared that, as the annexation of Texas was designed to extend and perpetuate slavery, he could not conscientiously vote for the measure. The democratic state convention thereupon struck his name from the ticket and nominated another man in his stead. He ran as an independent candidate, but was defeated. In 1846, by a combination of independent democrats and whigs, acting together to resist the extension of slavery, Mr. Hale was elected speaker of the house of representatives, and before the close of the session chosen U. S. senator for six years from Mar. 4, 1847. As a senator he was a zealous opponent of slavery extension and the compromises of 1850. In 1847 the liberty party nominated him for president, but he declined, and in the election of 1848 supported Van Buren and Adams. In 1852 he was the free-soil candidate for president, and received 157,685 votes. On retiring from the senate in 1853, he entered upon the practice of the law in New York, but in 1855 he was again elected to the U. S. senate to fill a vacancy. In 1858 he was re-elected for a full term of 6 years, during which he was an ardent supporter of the administration of Mr. Lincoln, taking an active part in the legislation necessary to the vigorous prosecution of the war. At the close of his term in 1865, he was appointed minister to Spain. He was recalled by president Grant, and returned home in 1870. Soon afterwards he suffered an attack of paralysis, from which he never recovered. In 1873 his hip was dislocated by a fall, which hastened his death.

HALE, NATHAN, 1755-76; b. Conn. He was a school teacher, but after the Lexington fight he joined the revolutionary army, and soon became a captain. At New York, in Sept., 1776, he and one associate at midnight took an English sloop laden with provisions from under the guns of a vessel of war. After the battle of Long Island, Hale offered to undertake a visit to New York city, to learn the British strength and plans. He was successful for some time, but was captured while returning to Washington's camp, and was taken to sir William Howe, who ordered his execution the next morning. Hale was denied the visit of a minister and was refused the use of a Bible. The letters he wrote to his mother were destroyed, and Hale died saying that "he lamented that he had but one life to lose for his country."

HALE, NATHAN, 1784-1863; b. Mass.; graduated at Williams college; studied law, and was admitted to the bar in 1810. In 1814 he and Henry D. Sedgwick edited the *Weekly Messenger*. In the same year Hale bought the *Daily Advertiser* of Boston, the first regular daily journal in the eastern states. The *Advertiser* was whig and afterwards republican in politics, and in his paper Hale opposed the admission of Missouri (with slavery), in 1820, and opposed the pro-slavery bill of 1834. In 1828 he published a book arguing for protection to home industry. He was also an early advocate and promoter of railroads. He was in both branches of the legislature, a member of two constitutional conventions, and belonged to various scientific societies.

HALES, ALEXANDER OF. See ALEXANDER OF HALES, *ante*.

HALÉVY, LÉON, b. Paris, 1802, brother of the composer. He became a supporter of St. Simon, and one of the founders of *Le Producteur*. In 1831 he was adjunct professor of literature in the polytechnic school, and in 1837-37 was prominently connected with the bureau of historical monuments in the ministry of the interior. Among his works are *Fables*, *La Grèce Tragique*, a resumé of Jewish history; *Luther or the Diet of Worms*, and *Électre*, a drama.

HALÉVY, LUDOVIC, b. Paris, 1834; son of Léon. He was for several years employed in the ministry of the state, and in the colonial office as chief of bureau; but he is known principally by his dramatic works, among which are libretti for the operas of *Orphée aux Enfers*; *La Belle Hélène*; *Barbe-Bleue*; *La Grande Duchesse*; *La Périochole*, and *Frou-Frou*.

HALFORD, SIR HENRY, 1766-1844; b. England; educated at Rugby and Oxford, and in 1794 became a fellow of the college of physicians, and soon gained extensive practice in London. In 1809 he was created a baronet, and was subsequently physician to the Georges III. and IV., to William IV., and finally to queen Victoria. He was president of the college of physicians in 1824. He published *Essays and Orations*; *The Death of Some Eminent Persons of Modern Times*, and some translations.

HALF-PAY (*ante*), a system in Great Britain of pensioning worn-out officers and those too old to do service in the army and navy, and in some cases in the civil service.

There is not precisely this system or practice in the United States, but there is sometimes a distinction between officers on active duty and those awaiting orders, while officers are retired on a proportionate amount of full-pay, according to length of service. These are some of the cases. In the navy:

Officers.	At Sea.	On Shore.	Waiting Orders.
Admiral.....	\$13,000	\$13,000	\$13,000
Vice-admirals.....	9,000	8,000	6,000
Rear-admirals.....	6,000	5,000	4,000
Commodores.....	5,000	4,000	3,000
Captains.....	4,500	3,500	2,800
Commanders.....	3,500	3,000	2,300
Lieutenant-Commanders.....	2,800	2,400	2,000
Lieutenants.....	2,400	2,000	1,600
Masters.....	1,800	1,500	1,200
Ensigns.....	1,200	1,000	800
Midshipmen.....	1,000	800	600
Cadet Midshipmen.....	500	500	500
Mates.....	900	700	500
Chief Medical Officers, Paymaster, and Chief Engineer.....	2,800	2,400	2,000
Chaplains.....	2,500	2,000	1,600
Boatswains, Gunners, Carpenters, and Sail-makers.....	1,200	900	700
Naval Constructors.....	3,200	3,200	2,200

In the army the salaries from maj.gen. downwards are graded as follows:

Officers.	Yearly Pay of Officers in Active Service.					Half-pay of Retired Officers.				
	1st 5 yrs.	After 5 yrs.	After 10 yrs.	After 15 yrs.	After 20 yrs.	1st 5 yrs.	After 5 yrs.	After 10 yrs.	After 15 yrs.	After 20 yrs.
Maj. general.....	\$7,500					\$5,625				
Brig. general.....	5,500					4,125				
Colonel.....	3,500	\$3,850	\$4,200	\$4,500	\$4,500	2,625	\$2,887	\$3,150	\$3,375	\$3,375
Lieut. col.....	3,000	3,300	3,600	3,900	4,000	2,250	2,475	2,700	2,925	3,000
Major.....	2,500	2,750	3,000	3,250	3,500	1,875	2,062	2,250	2,437	2,625
Captain (mounted).....	2,000	2,200	2,400	2,600	2,800	1,500	1,650	1,800	1,950	2,100
" (not mounted).....	1,800	1,980	2,160	2,340	2,520	1,350	1,485	1,620	1,755	1,890
1st Lieut. (mounted).....	1,600	1,760	1,920	2,080	2,240	1,200	1,320	1,440	1,560	1,680
" (not mounted).....	1,500	1,650	1,800	1,950	2,100	1,125	1,237	1,350	1,462	1,575
2d Lieut. (mounted).....	1,500	1,650	1,800	1,950	2,100	1,125	1,237	1,350	1,462	1,575
" (not mounted).....	1,400	1,540	1,680	1,820	1,960	1,050	1,155	1,260	1,365	1,470
Chaplain.....	1,500	1,650	1,800	1,950	2,100	1,125	1,237	1,350	1,462	1,575

HALIFAX, a co. in North Carolina, on Roanoke and Fishing rivers, intersected by the Wilmington and Weldon, and the Raleigh and Gaston railroads; 680 sq.m.; pop. '80, 30,300—21,138 colored. Much is still covered with forests. The soil is fertile, producing cotton, corn, etc. Co. seat, Halifax.

HALIFAX, a co. in s. Virginia, on the North Carolina border, on Dan river, intersected by the Richmond and Danville railroad; 960 sq.m.; pop. '70, 27,828—16,266 colored. Soil fertile; chief productions: tobacco, corn, wheat oats, and pork. Co. seat, Halifax Court-House.

HALIFAX, a co. in s. Nova Scotia, on the Atlantic coast; area 2,450 sq.m.; pop. '71, 56,963. The region is fairly fertile, and the coast is deeply indented with bays, some of which afford good harbors. Chief town, Halifax (city). There is railroad communication around the bay of Fundy to St. Johns and the United States and Canada.

HALIFAX, MARQUIS of. See SAVILLE, GEORGE, *ante*.

HALIFAX COURT-HOUSE, the seat of justice of Halifax co., Va. It is also called Banister (q. v.), and is on the river of that name, in the midst of a tobacco raising region. Pop. about 700.

HALIFAX RIVER, in Volusia co., Fla.; a tide-water channel running inland 30 m. from Mosquito Inlet and continuing s. to Hillsborough river. It is navigable.

HALIM PASHA. See ABD-EL-HALIM.

HALL, as known at the great seats of learning in England is connected with a college though not incorporated nor as a rule endowed. Many years ago there were 500 halls at Oxford, but now there are very few. The number of colleges connected with the great universities in which provision was made for the support of the members was, for many centuries, small in comparison to the halls or inns (*aulæ, hospitia*), in which the students lived chiefly at their own expense, and were merely furnished with cheap and convenient lodgings. At the commencement of the 14th c. the number of halls was about three hundred, while the colleges amounted only to three. For the establishment

of a hall, nothing more was necessary than that a few students, on a mutual agreement to live together, should hire a house, find security for a year's rent, and choose for principal a graduate of respectable character. The chancellor or his deputy could not refuse to sanction the establishment, and to admit the principal to his office. The halls were in general held only on lease; but by a privilege common to most universities, the rent was fixed every five years by sworn taxers, two masters, and two citizens; and houses once occupied by students could not be resumed by the proprietors so long as the rent was punctually paid. The halls were governed by peculiar statutes, and were liable to be visited and regulated by the university. The causes which occasioned a diminution in the number of the scholars, diminished also the number of the halls, though that of the endowed colleges continued to increase. At the commencement of the fifteenth century, while the students were diminishing, the colleges had risen to seven. In the beginning of the sixteenth century, the number of halls had fallen to fifty-five, while the endowed colleges had increased to twelve. In 1546 the inhabited halls amounted to only eight; and in 1651, Wood remarks that, "the ancient halls lay either waste, or were become the receptacles of poor religious people turned out of their cloisters."

HALL, a co. in n. Georgia, on the Chattahoochee drained by the Oconee, intersected by the Atlantic and Richmond air line railroad: 600 sq.m.; pop. '70, 9,607—1290 colored. The surface is hilly; main products: corn, wheat, and hay. Gold and precious stones have been found.

HALL, a co. in central Nebraska on Platte river, crossed by the Union Pacific railroad; 576 sq.m.; pop. '76, 4,615. It has an undulating prairie surface, and good soil for pasturage. Corn, wheat, and oats are raised. Co. seat, Grand Island.

HALL, CHARLES FRANCIS, 1821-71; b. N. H. He was first a blacksmith, then a journalist in Cincinnati, and after that carried on the business of an engraver in the same city. The publication of Dr. Kane's account of the first Grinnell expedition to the arctic regions first awakened his interest in that part of the world, and from that time (1853) to 1860, when he made his first expedition, his leisure was entirely devoted to this engrossing subject. This expedition was the result of his own exertions, and his equipment consisted of two boats, with sledges, the entire outfit being conveyed northward on a small whaler, commanded by capt. Buddington. In spite of the meager character of his resources, the explorer displayed his dauntless and energetic character by his achievements, even in this his first journey. He remained two years in the arctic regions, thoroughly informed himself of the Esquimaux or Innuït habits, continued his exploration until disabled by the loss of his boats, and succeeded in adding 1500 miles of coast line to the charts. Returning home in a whaler, he brought with him "Joe" and "Hannah," two Esquimaux, from whom he continued to receive instructions in the Innuït language, while he made efforts to obtain the necessary means for a second expedition on a larger scale. Through the liberality of Mr. Henry Grinnell, he accomplished his wish, and in 1864 sailed on board the *Monticello*, capt. Buddington. He now passed five years among the Esquimaux, chiefly in King William's land, and at Repulse bay and Pelly bay. The object of these two expeditions was to obtain tidings of the lost Franklin expedition, and in this capt. Hall was so far successful as to obtain many relics of the crews of the *Erebus* and *Terror*. He received much information from the natives, and even gained possession of a skeleton, which was afterwards forwarded to England. Hall returned in 1869, and remained in the United States eighteen months, preparing for the publication of the account of his explorations, delivering lectures, and endeavoring to interest the U. S. government in the prosecution of still another expedition—this time, with the design of reaching the North Pole if practicable. He was fortunate in infusing some of his own enthusiasm into the prominent members of the government, and in 1870 the *Polaris* was fitted out for his use, and sailed on July 3 of that year. Most unhappily, capt. Hall died on Nov. 8, 1871, and the expedition came to an abrupt conclusion. The *Polaris* was abandoned in the ice, and a portion of her crew under capt. Tyson, floated 195 days on a floe, before being rescued. Hall was buried in the ice, on the coast of Greenland. The history of capt. Hall's three expeditions will be found in *Arctic Researches* (1864), and in two volumes published from his manuscripts by order of the U. S. government.

HALL, CHARLES HENRY, D.D.; b. Ga., 1820; educated at Phillips academy, Andover, Mass., and graduated at Yale, soon after which he entered the ministry of the Protestant Episcopal church in Charleston, S. C. After useful service as a rector of a church in Washington, D. C., he became rector of the church of the Holy Trinity in Brooklyn, where his ministry has been noted for vigor, earnestness, and large success. He has published *Commentaries on the Gospels*, *True Protestant Ritualism*, and *Spina Christi*.

HALL, DOMINICK AUGUSTINE, 1765-1820; b. S. C. In 1806 he was district judge in the territory which was afterwards the state of Louisiana, and after the state was organized he continued in the same office until near the time of his death. His name became widely known in consequence of his arrest by gen. Jackson for trying to release by habeas corpus a military prisoner. Jackson was fined \$1000 for contempt of court, and paid it. Nearly 30 years later congress repaid the fine with interest.

HALL, GORDON, 1784-1826; b. Tolland, Mass; graduated at Williams college, 1808; ordained at Salem, 1812, and sailed Feb. 18 for Calcutta as a missionary of the A. B. C. F. M. The East India company refusing him permission to remain in its territory he sailed for Bombay, arriving Feb. 11, 1813. Being ordered by the governor-general to leave for England, he presented the cause of the heathen with such power that he was allowed to remain. He possessed great vigor of intellect and force of character, indomitable courage, and a heart consecrated to missionary work. His *Appeal in Behalf of the Heathen*, and *The Conversion of the World, or Claims of Six Hundred Millions*, made a profound impression. After laboring 13 years, and completing the revision of the New Testament in Mahratta, he died of cholera, after a few hours' sickness, in Bombay.

HALL, JAMES, 1793-1868; b. Penn.; studied law, but joined the army in 1812, and in the war with Great Britain distinguished himself in engagements at Lundy's Lane, Niagara, and Fort Erie. On the conclusion of the war he accompanied an expedition against Algiers, but in 1818 he resigned his commission, and continued the study of law at Pittsburg. In 1820 he removed to Shawneetown, Ill., where he commenced practice at the bar, and also edited the *Illinois Gazette*. Soon after he was appointed public prosecutor of the circuit, and in 1824 circuit judge. On the abolition of the latter office four years afterwards he was appointed state treasurer, but he continued at the same time his legal practice, and also edited the *Illinois Intelligencer*. Subsequently he became editor of the *Western Souvenir*, an annual publication, and of the *Illinois Monthly Magazine*, afterwards the *Western Monthly Magazine*.

HALL, JAMES, LL.D., b. Mass. 1811. A distinguished geologist and palæontologist. Intending at first to follow the medical profession, his attention was diverted to natural history, which study he followed in the Rensselaer Polytechnic institute, Troy, N. Y., where he became professor of geology. In 1837 he commenced the series of explorations as one of the geologists appointed for the survey of the state of New York, describing the results of his work in annual reports, the last of these being one of the quarto volumes of the *Natural History of the State of New York*. Being appointed palæontologist to the state of New York, Dr. Hall devoted himself to the preparation of the magnificent series of volumes on that subject, which have been published at intervals since 1847. He also contributed largely to national reports of surveys (Fremont, Stansbury, etc.), and has written voluminously on many important disputed questions in geology and palæontology. The palæontological section of the state cabinet of natural history at Albany, N. Y., was for many years in Dr. Hall's charge.

HALL, JOHN, D.D., b. Ireland, 1829; educated at Belfast college; licensed at 20 years of age to preach, and began as a missionary (Protestant) in the w. of Ireland. In 1852 he was pastor of a Presbyterian church in Armagh, and in 1858 was a minister in Dublin. The queen gave him the appointment of commissioner of education for Ireland. In 1867 he was a delegate from Ireland to the Presbyterian churches of the United States. In 1867 he became pastor of the Fifth avenue Presbyterian church, New York city, where he became so popular that it was found necessary to erect a larger edifice. Dr. Hall has also achieved great popularity as a lecturer. Among his writings are *Family Prayers for Four Weeks*, *Papers for Home Reading*, and *Questions of the Day*. He has a widespread reputation for pulpit eloquence.

HALL, LYMAN, 1725-90; b. Conn.; a signer of the declaration of independence; graduate of Yale and a physician. He was a member of congress from Georgia, and governor in 1783. While Georgia was subject to English rule his entire property was confiscated.

HALL, NEWMAN, LL.B.; b. England 1816; an English clergyman, having a charge at Hull, and later, pastor of the "Rowland Hill" chapel in London. He was a firm advocate of the union cause during the war of the rebellion in the United States, coming here, speaking in the loyal interest, and preaching before congress. In 1866 he was president of the Congregational union. He is widely known as an earnest advocate of total abstinence, upon which he has delivered many sermons and lectures. In 1873 he made a second American visit and lectured in many of the large cities. Some of his works are *The Christian Philosopher*, *The Land of the Forum and the Vatican*, *Lecture on America, From Liverpool to St. Louis*, *Pilgrim Songs*, etc.

HALL, SAMUEL CARTER; b. England 1800; studied law, but turned his attention to literature. He was a reporter of parliamentary debates, and afterwards editor of Colburn's *New Monthly Magazine*. For several years, with the able assistance of his wife, he wrote and compiled the *Annals* once so popular in England and America, and many other works. In 1839 he edited the *Art Journal*. Among his works are *A Book of Memoirs of Great Men and Great Women*, *Book of British Ballads*, *Baronial Halls*, etc. Mr. Hall has always been devoted to charitable objects, and has assisted in the foundation of eminent public establishments of this character.

HALLAM, ARTHUR HENRY, 1811-33; son of Henry Hallam, the historian; b. London. He was educated at Eton college, and in 1833 went with his father on a tour in Europe, but died a few weeks afterwards in Vienna. He was engaged to be married

to a sister of Alfred Tennyson, and his death was the motive of the remarkable poem *In Memoriam*.

HALLEL, signifying *praise*, is a name given to a part of the Jewish hymnal service which was chanted both in the temple and the family. It consists of Ps. cxlii—cxviii. It is called the *Egyptian hallel* because the paschal lambs were slain while it was chanted. Another hallel is called the *great hallel* and designates the response repeated after every verse in Ps. cxxxvi. The *Egyptian hallel* was chanted for 20 days in the year in the temple at the celebration of the passover and other festivals. It was chanted also in private families on the first evening of the passover. The singing of the hymn by Christ and the disciples at the close of the passover supper is supposed to be the second part of this hallel, comprising Ps. cxv. and cxvi., which was chanted while drinking the fourth and last cup. The great hallel was chanted on special joyful occasions. The Egyptian hallel is now recited by the Jews at all the feasts but new year, the day of atonement, the last six days of the passover, and the new moon. It is uncertain when this service was instituted, different Jewish writers ascribing it to Moses, Joshua, David, Deborah, Hezekiah and others. Maimonides and Buxtorf have written extended but not entirely satisfactory works on the subject.

HALLIWELL, JAMES ORCHARD, b. England, 1820; especially noted as an archæologist and writer on Shakespeare. He has published, among other works, *Life of Shakespeare, Descriptive Calendar of the Records of Stratford-on-Avon, An Account of the New Place* (Shakespeare's residence) at Stratford-on-Avon, an immense edition of *Shakespeare's Works* in 16 quarto vols.; *Illustrations of the Life of Shakespeare in a Discursive Series of Essays, Dictionary of Archaic and Provincial Words, Popular Rhymes and Nursery Tales*, etc.

HALLOCK, WILLIAM ALLEN, D.D., 1794-1880, son of rev. Moses; b. Plainfield, Mass., graduated at Williams college and Andover theological seminary, ordained 1826. He founded the American tract society at New York, 1825, was for 45 years its secretary and general agent, and in its service for more than 50 years. His mind was clear and vigorous; and his rare industry and efficiency appear in the fact that nearly 4,000 publications, including 881 volumes, were examined and prepared by him line by line for the press. About the same number passed under his eye for approval for translation, and with the aid of the society's funds, were printed at mission stations in 145 different languages and dialects. He was the author of tracts and books, of which in all 1,400,000 copies were circulated in his life time.

HALMSTAD, a t. in Sweden, on the e. shore of the Cattegat, about 76 m. s.s.e. of Gothenburg, at the mouth of the river Nissa; pop. '75, 7,136. The castle is the residence of the governor of the province. Mention of the church of Halmstad occurs as early as 1462, and the fortifications are mentioned first in 1225. The latter were demolished in 1736. The Dominican and Franciscan monasteries, formerly in the town, are now quite destroyed. The harbor built in 1837-40, at a cost of about £5,250, admits ships of 10 ft. draught, by means of which some trade in deals, pitch, and tar is carried on. The salmon fishery is important. An archæological society holds its meetings in Halmstad, and the popular magazine, *Scensku Family Journalen*, is published there. There are both mineral and sea-water baths in the neighborhood. The oldest town-privileges of Halmstad date from 1307, while the first recorded event in its military history is the battle of Nissa, between Harold Hardrada and Sven Ulfsson. During the revolt of the miner Engelbrekt, it twice fell into the hands of the rebels—in 1434 and 1436. The town appears to have been frequently chosen as the meeting-place of the rulers and delegates of the three northern kingdoms; and under the union of Calmar it was appointed to be the place for the election of a new Scandinavian monarch whenever necessary. The län of Halland formed part of the territory of Denmark in Sweden, and, accordingly, in 1534, during his war with the Danes, Gustavus Vasa assaulted and took its chief town. In 1660, by the treaty of Copenhagen, the whole district was ceded to Sweden. In 1676 Charles XII. defeated near Halmstad a Danish army which was attempting to retake the district, and since that time Halland has formed part of Sweden.

HALPINE, CHARLES G., 1829-1868; b. Ireland; graduated at Dublin university; began life as a journalist. In 1847 he came to New York, and was employed on various city papers there and in other cities. He enlisted in the union army early in the war of the rebellion, and rose to be brig. gen. of volunteers. He was also a maj. in the regular army. While in the service, his papers over the signature of "Private Miles O'Reilly" were immensely popular. After the war he was elected register of the county of New York. He published many short poems, and was proprietor and editor of the *Citizen* newspaper, published in New York. He was a brilliant and vivacious writer, and socially a general favorite.

HALS, FRANS, 1584-1666; a Dutch painter second only to Rembrandt. At the time when the Dutch nation fought for independence and won it, Hals appears in the ranks of its military guilds. He was also a member of the chamber of rhetoric, and chairman of the painters' corporation at Haarlem. But irregularities of life marred his success, and in 1654 the forced sale of his pictures and furniture for debt brought him into

absolute penury. At one time his rent and firing were paid by the municipality, which afterwards gave him an annuity of 200 florins. Hals's pictures illustrate the various strata of society into which his misfortune led him. His banquets or meetings of officers, of sharpshooters, and guildsmen are the most interesting of his works. But they are not more characteristic than his low-life pictures of itinerant players and singers. His portraits of gentlefolk are true and noble, but hardly so expressive as those of fishwives and tavern heroes. His first master was Van Mander, the painter and historian. Of his numerous children, the best known is FRANS HALS, the younger, 1622-69. His pictures represent cottages and poultry, and the "Vanitas" at Berlin, a table laden with gold and silver dishes, cups, glasses, and books, is one of his finest works and deserving of a passing glance. Quite in another form, and with much of the freedom of the elder Hals, DIRK HALS, his brother, is a painter of festivals and ball-rooms. But Dirk had too much of the freedom and too little of the skill in drawing which characterized his brother. He remains second on his own ground to Palamedes. A fair specimen of his art is a "Lady playing a Harpsichord to a Young Girl and her Lover" in the Van der Hoop collection at Amsterdam. More characteristic, but not better, is a large company of gentlefolk rising from dinner, in the academy at Vienna.

HALSTEAD, MURAT, b. Ohio, 1829; a journalist, long the editor of the *Cincinnati Commercial*. He was educated at Farmers' college, College Hill, Ohio, and began to write for newspapers in Cincinnati at the age of 18. In 1851 he started a Sunday journal which lived two weeks. After roughing it on various papers, he got a place on the *Commercial* and slowly gained way until he became the responsible head. He is an active politician, though claiming to be independent of all parties.

HALTON, a co. in the province of Ontario, Canada, on lake Ontario, near the w. end; 362 sq. m.: pop. '71, 22,606. It is crossed by the Great Western, and the Grand Trunk railroads. Seat of justice, Milton.

HALYS, now known as Kizil Temak or Red river, the largest stream in Asia Minor. It rises in Pontus, and flows s.w. until it reaches the Mons Argeus; thence turning in a northerly direction it traverses Galatia as far as Gangra, the frontier town of Paphlagonia. Its course is then in a n.e. direction; and separating Galatia and Pontus from Paphlagonia, it discharges itself into the Euxine sea. Its mouth is 50 m. distant from Sinope. The Halys being the largest river of Asia Minor, a common division of the country was Asia cis-Halyn and Asia trans-Halyn. This river is 500 m. in length, but is not adapted for navigation, and in summer is so shallow as to be easily crossed by wading.

HAMAN, vizier and chief minister of Ahasuerus, king of Persia. After the failure of his attempt to exterminate the Jews in the kingdom, Haman was hanged on the gibbet which he had prepared for Mordecai. Jewish tradition declares Haman to have been descended from a chief family of the Amalekites, their ancient enemies; and it is said that many modern Jews apply the name Haman to any enemy, even Christians.

HAMASAH, more correctly HAMASEH, the name of a famous Arabian anthology compiled by Habib ibn Aus et-Tâi, surnamed Abû Temmân, which consists of 10 books, containing 884 poems on various subjects. These poems are fragmentary, and belong to the class of extempore utterance. The compiler himself was a distinguished poet in the style of his day (832 A.D.), who wandered through the provinces of the Moslem empire. He visited Khurâsân, then ruled by Abd-allâh, son of Tâhir, who rewarded him in various ways. On his return home, he was detained at Hamadan, and was for many months the guest of Abul-Wafâ, son of Selemeh. There he compiled a portion of the Hamasah, which remained a precious heirloom in the hands of the family of his host, until the decay of their fortunes, when a man named Dinawar took it to Ispahan and left in the care of the learned men there. The Hamasah is justly celebrated for its truth to nature, and while of little value as a historical record, forms a complete portrait of the hardy and manful natures, and the lives of passion and storm which characterized the valiant stock who bore Islam abroad in a flood of new life over the worn-out civilizations of Persia, Egypt, and Byzantium.

HAMBACH, a village in Bavaria, 15 m. w. of Spire; pop. about 2,200. On May 27, 1832, there was held here a political meeting, the Hambacher Fest, which was attended by 30,000 persons, who combined to forward a movement for "the regeneration of Germany as a free country." A year afterwards there was a conflict at the anniversary celebration, and thereafter the meetings were forbidden. The village contains an old castle built in the middle ages. It was greatly damaged in the revolution of 1849.

HAMBLETON, a co. in e. Tenn., between the French Broad and Holston rivers, intersected by the east Tennessee, Virginia and Georgia, and the Cincinnati, Cumberland Gap and Charleston railroads; 160 sq. m.; formed after the census of 1870. It is hilly or undulating, and the soil is fertile. Co. seat, Morristown.

HAMERTON, PHILIP GILBERT, b. England, 1834. At the age of sixteen he made his appearance as an author, in *Rome* in 1849, and in the following year published a volume on heraldry. He had already devoted himself with considerable earnestness to the study of landscape-painting, and his passion for the art induced him to spend two

years in Paris, which were devoted in this direction, and to explorations in French literature. In 1858 he commenced the periodical encampments on an island in loch Awe, which continued during several years, and which he afterwards described in *A Painter's Camp in the Highlands*, and *Thoughts about Art*. In 1861 Mr. Hamerton went to reside in France, where he produced some important pictures, becoming also a contributor to the *Fine Arts Quarterly Review*, and to the *Fortnightly*. He also wrote art criticisms for the *Saturday Review*, and published several critical works on French art. In 1869 he founded the *Portfolio*, which soon achieved a high position in the esteem of cultivated persons, and became an authority in art matters, dignified by care in writing, and remarkable excellence in illustration. He has also written *The Unknown River; An Etcher's Voyage of Discovery; Chapter on Animals; the Sylvan Year; the Life of Turner; The Intellectual Life; and Round my House*.

HAMI, or KOMUL, a t. in central Asia, on the s. slope of the Thian-Shan mountains and the n. verge of the Gobi desert, $42^{\circ} 48'$ n., and $93^{\circ} 28'$ e., 3,150 ft. above tide. The town is first mentioned in Chinese history in the 1st c., under the name I-wu-lu, and said to be situated 1000 lis (a li is one third of a mile) n. of the fortress Yu-men-kuan, and to be the key to the western countries. This evidently referred to its advantageous position, lying as it did in a fertile tract, at the point of convergence of two main routes running n. and s. of the Thian-Shan, and connecting China with the west. It was taken by the Chinese in 73 A.D. from the Hingnu (the ancient inhabitants of Mongolia), and made a military station. It next fell into the hands of the Uigurs, or eastern Turks, who made it one of their chief towns and held it for several centuries, and whose descendants are said to live there now. From the 7th to the 11th c., I-wu-lu is said to have borne the name of Igu, or I-chu, under the former of which names it is spoken of by the Chinese pilgrim Hwen-Tsang, who passed through it in the 7th century. The name Hami is first met with in the Chinese *Yuan-shi*, or *History of the Mongol Dynasty*, but the name more generally used there is Homi-li or Kom-li. Marco Polo, describing it apparently from hearsay, calls it Camul, and speaks of it as a fruitful place, inhabited by a Buddhist people of idolatrous and wanton habits. Owing to its commanding position on the principal route to the west, and its exceptional fertility, it has very frequently changed hands in the wars between China and her western neighbors. As regards the latter quality, it is even now said to yield rice, melons, oranges, and grapes of notable excellence, while, with respect to the former, baron F. Von Richthofen states that the route from Hsi-ngan-fu past Hami to Kuldja, is by far the best and indeed the only natural line for a railway from China to Hami. The Russian officer Sosnofski entered it in the autumn of 1875, after eight days' journey across the Gobi steppe lying to the south. He speaks of it as an important mart, whither wool from Turfan and Turkistan goods are brought to be exchanged for the products of central China. The Mohammedan population consists of immigrants from Jitishahr (or Kashgaria) Bokhara, and Samarcand, and descendants of the Uigurs. [*Encyc. Brit.*, 9th edition.]

HAMILTON, a co. in n. Florida, n. and w. of Suwanee river, and intersected by the Allapaha, and crossed by the Atlantic and Gulf railroad; 400 sq.m.; pop. '70, 5,749—2,363 colored. The soil is level and sandy, and much of the surface is covered with forests. Cotton and corn are the chief products. Co. seat, Jasper.

HAMILTON, a co. in s. Illinois, crossed by the St. Louis and Southwestern railroad; 395 sq.m.; pop. '70, 13,014. The surface is mostly level, and the soil is fertile, producing corn, oats, wheat, etc. Co. seat, McLeansborough.

HAMILTON, a co. in central Indiana, on the w. fork of White river and Eagle and Cicero creeks, crossed by the Indianapolis, Peru and Chicago, and the Anderson, Lebanon and St. Louis railroads; 400 sq.m.; pop. '70, 20,882. Surface level; chief products: wheat, corn, hay, and pork. Co. seat, Noblesville.

HAMILTON, a co. in n. central Iowa, on Boone river, intersected by a section of the Illinois Central railroad; 576 sq.m.; pop. '75, 7,701. The surface is undulating prairie and woodland; chief productions: wheat, corn, oats, and hay. Co. seat, Webster City.

HAMILTON, a co. in w. Kansas on the Colorado border, intersected by Arkansas river and the Atchison, Topeka, and Santa Fé railroad; 975 sq.m.; formed after the census of 1870. The surface is undulating, and there is little timber. Co. seat, Syracuse.

HAMILTON, a co. in s.e. Nebraska on Platte river, drained by forks of the Big Blue; 500 sq.m.; pop. '76, 6,253. Surface mostly level; wheat, corn, oats, and hay are the chief products. Co. seat, Aurora.

HAMILTON, a co. in n.e. New York, mostly in the Adirondack wilderness at the headwaters of the Racket, Black, Hudson, and Sacondaga rivers; 1745 sq.m.; pop. '75, 3,482. The surface is rough, and there are a great number of small lakes and ponds. The soil is not well adapted to agriculture. Co. seat, Sageville.

HAMILTON, a co. in s.w. Ohio bordering on Indiana, crossed by the Miami, and bounded e. by Little Miami river; intersected by the various railroads that center at

Cincinnati; 400 sq. m.; pop. '70, 260,370. The surface is moderately hilly, and the soil is very fertile. The main productions are corn, oats, hay, wheat, butter, pork, and wine. Co. seat, Cincinnati, the largest city in the state.

HAMILTON, a co. in e. Tennessee on the Georgia border, crossed by Tennessee river and by three or four railroads centering at Chattanooga; 575 sq. m.; pop. '70, 17,241—4,188 colored. The surface is mountainous, but the valleys are fertile, producing corn, wheat, etc. Coal and iron are found. Co. seat, Chattanooga.

HAMILTON, a co. in n. central Texas on Leon river; 850 sq. m.; pop. '70, 733—17 colored. Surface hilly, affording good pasturage. Cattle-raising is the main business. Co. seat, Hamilton.

HAMILTON, the seat of justice of White Pine co., Nev., 100 m. s. of Elko. It is at the foot of Treasure hill, in a barren region where water and timber are very scarce; pop. '70, 3,913. Its importance rises solely from the silver mines in the neighborhood.

HAMILTON, a t. in Madison co., N. Y., 29 m. s.w. of Utica on the Chenango canal and the Utica, Clinton, and Binghamton railroad; pop. '75, 370. The Madison university (Baptist) is in the town; also the Hamilton theological seminary, and the Hamilton female seminary.

HAMILTON, a city in Butler co., Ohio, on Miami river and canal, 20 m. n. of Cincinnati, with which it is connected by the Cincinnati, Hamilton, and Dayton railroad; pop. '70, 11,081. The city contains a number of important manufacturing establishments, such as iron foundries, flouring mills, etc. There are two parks, twelve churches, good schools, and a free library.

HAMILTON, ALEXANDER (*ante*), ranks next to Washington among the statesmen of the period immediately following the war of the revolution. Jefferson transcended him neither in patriotism nor ability, but only in a clearer recognition and bolder assertion of popular rights as against established precedents. He played a part in the formation and early administration of the national government, without which it is at least doubtful whether it would have proved a success. If in some respects he was too conservative to suit the prevailing tendencies of the period, it is probable that for that very reason he was all the better qualified to guide the country in its transition from the ancient subservency to the new independence. No man saw more clearly than himself the necessity of throwing off the yoke which Great Britain sought to impose upon the colonies, and few if any rendered more valuable service than he in the cause of independence; and his distrust of democracy as expounded and applied by Jefferson was no doubt shared by many of the lights of that day, including Washington himself. He espoused the national cause with all the ardor of youthful patriotism, but when the time came to organize the new government he was fearful of too wide a departure from the ancient British models. He first attracted public notice by a remarkable political speech which he delivered when only 17 years of age, while he was a student in Columbia college, and in the next two years his writings in defense of the American cause displayed such ability that, in part at least, they were for a time attributed to John Jay. He enlisted as a soldier early in 1776, and was commissioned as a capt. of artillery. He soon attracted the notice of Washington, who at once recognized his extraordinary ability. He took part in the battle of White Plains, shared the retreat of the American forces through New Jersey, and fought at Trenton and Princeton. In March, 1777, he accepted the appointment of aid-de-camp on Washington's staff, and was of great assistance to him in the conduct of his large and very perplexing correspondence. The commander-in-chief indeed found in him, in spite of his youthfulness, an adviser on whose judgment in the most delicate and confidential matters he could safely rely. He took part in the battles of Brandywine and Germantown, and spent the winter with his chief at Valley Forge. He was present at the battle of Monmouth in 1778, and in the duel which followed between Laurens and Lee, acted as second of the former. When the French admiral D'Estaing arrived at Sandy Hook, Hamilton was sent to confer with him as to the part he was to take in the war. He was at West Point when Arnold's treachery was discovered, and earnestly advised Washington to yield to André's request to be shot and not hung. In 1780 he married a daughter of Philip Schuyler, and shortly afterwards, taking offense at what he thought an undeserved rebuke from Washington, tendered his resignation upon the spot, and refused to withdraw it, notwithstanding Washington made an apology. This occurrence, however, did not permanently interrupt their friendly relations. Hamilton was appointed commander of a New York battalion, and at the siege of Yorktown led a successful assault upon one of the British outworks. In 1782, having studied for a time with his father-in-law in Albany, he was admitted to the bar. He was shortly afterwards elected by the legislature of New York a delegate to the continental congress, in which capacity he took an active part in the settlement of important questions growing out of the war. He was one of the first to see the utter inadequacy of the articles of confederation as the framework of a national government. After the evacuation of New York by the British, he resigned his seat in congress and entered upon the practice of the law in that city. A large number of tory lawyers having been excluded from practice by act of the legislature, the young attorney found a wide field open before him, and at once achieved a marked success. He

distinguished himself especially in certain suits arising out of the war, in which he took a position opposed to the public sentiment of the time, defending it with masterly ability and convincing the judgment of the court. From the first he displayed remarkable ability in handling questions of finance, and naturally enough took an active part in establishing the bank of New York. He was also one of the founders of the New York manumission society, sharing the hostility to slavery common among the most eminent patriots of his time. He also took an honorable part in the settlement of the differences between New York and Vermont, by which the latter became an independent state. His services in the convention of 1787, which framed the constitution of the United States, were of the highest value. He saw that the articles of confederation were a rope of sand, and that it was impossible to organize under them a government that would foster the instinct of nationality and command the respect of the world. His colleagues from New York were strongly opposed to him, and there was in the convention a morbid hostility to any plan tending to dwarf the powers of the states. By his efforts and those of other men likeminded, the tide was turned at length in favor of a national government that should rest upon the authority not of the states but of the people, and that should have power to defend itself alike against foreign and domestic foes. He offered a written sketch of such a government, differing in many respects from the one afterwards adopted, but illustrating the conservatism of the period. He was absent from the convention for a time, and, before he returned, his New York colleagues, finding the sentiment of the body turning in favor of a strong national government, resigned their seats in disgust, leaving him to represent the state alone. The constitution finally adopted did not wholly satisfy him, but when he saw that it was the best that could be obtained he supported it warmly; and no other man probably did so much as he to secure its ratification by the people. The series of 85 papers known under the title of *The Federalist*, of which 63 were written by him, no doubt served to commend the constitution to popular favor. These papers are still an authority upon many of the subjects therein discussed, and well deserve the place they hold in the political literature of the nation. Madison and Jay took part with Hamilton in their composition, though they were for the most part his own work. When Washington was chosen president, he selected Hamilton for secretary of the treasury—a post for which he was especially fitted, and in which his services were of the highest value to the country. He successfully resisted every scheme for repudiating the national debt, thus establishing the credit of the nation upon a stable foundation. Some of the measures he proposed met with a stubborn resistance, but he carried most of them successfully through. His funding system won the support of the moneyed and mercantile classes, as did also the national bank which he proposed, though the latter was denounced in influential quarters as dangerous to popular liberty. Upon this and some other questions he encountered the opposition of Jefferson, between whom and himself a bitter controversy arose, which led to the retirement of the former from the cabinet. It deserves to be mentioned that the policy of so imposing duties on foreign imports as to afford protection to American manufactures, was advanced by Hamilton in a report which he presented at the first session of the second congress. Having succeeded in putting into operation the plans he had proposed, and finding his salary inadequate to his support, he resigned at the end of six years of service, Jan. 31, 1795, and resumed the practice of the law. He was still, however, a zealous supporter of Washington's administration, using his pen efficiently to sustain the measures it proposed. Washington, when about to prepare his farewell address to the country, sought and received Hamilton's advice, and it is by no means improbable, in view of the well-known relations of the men, that the latter assisted in the preparation of that celebrated paper. Hamilton did not escape imputations upon his integrity as secretary of the treasury. An attempt was made to prove that he had taken advantage of his official position for speculative purposes. He defended himself against these charges with entire success, but in doing so made an admission that left a stain of another sort upon his private character. Letters of his to a well-known speculator, implying confidential relations between them, were produced to confirm the current suspicion. Hamilton saw that he could not successfully defend himself without explaining the occasion of the letters in question, which he did in the frank confession that they had grown out of an intrigue with the wife of his correspondent. To save his character for official and political integrity, which had been falsely assailed, he acknowledged himself guilty of what he doubtless thought a more excusable offense. In consequence of the apprehensions of war with France, growing out of the ratification of Jay's treaty, measures were taken in 1798 to augment the army of the United States, and Washington was appointed commander-in-chief with the title of lieutenant-general. He accepted the position on condition that he should not be called into the field, except in case of actual hostilities, and that Hamilton as major-general should attend to the work of organizing the army. After the death of Washington in 1799, Hamilton was appointed commander-in-chief; but the war-cloud passed away, and he resumed the practice of the law in New York. He was, however, a conspicuous leader of the federal party, and took an active part in the political controversies of the time. Aaron Burr was a leader of the democratic party, and there sprang up between the two men a hostility which neither cared to disguise. Burr, embittered by his failure to be elected president, partly through Hamilton's influence,

sought an election as governor of New York, hoping for success by the help of the federalists. But here again the influence of Hamilton barred his way, and he was defeated. In his exasperation he called upon Hamilton to disavow certain expressions derogatory to himself which he was assumed to have uttered. Failing to procure the desired disavowal, he challenged Hamilton. The latter felt himself compelled, for reasons of a public nature, to accept the challenge, and the duel was fought at Weehawken, July 11, 1804, and Hamilton at the first fire was mortally wounded, dying the next day. His death had the effect of rousing a public sentiment against dueling such as had not before existed in the northern states. Burr lived for 32 years after this, but with the stigma upon his character from which he never recovered. By multitudes he was denounced and shunned as a murderer. Hamilton's widow died in 1854 at the age of 97. His son, John C. Hamilton, wrote his life and compiled his works; the former (in 2 vols., 8vo.) in 1851. On Nov. 23, 1880, a granite statue of Hamilton was unveiled in Central park, New York, in the presence of members of the society of the Cincinnati, of gen. U. S. Grant, ex-gov. Bullock of Massachusetts, the mayor of the city, and of other distinguished personages, besides a large concourse of spectators. The statue is the work of Charles Conrads, and was presented to the city of New York by John C. Hamilton, a son of Alexander Hamilton. Talleyrand, when in New York, on seeing Hamilton at work late at night in his office, said of him: "I have seen one of the wonders of the world. I have seen a man laboring all night to support his family, who has made the fortune of a nation." And again: "I consider Napoleon, Fox, and Hamilton the three greatest men of our epoch, and without hesitation I award the first place to Hamilton."

HAMILTON, ANDREW, d. 1703 in New Jersey. He was of Scottish birth, and was governor of the colony of New Jersey 1692-98, 1699-1701; afterwards lieut. gov. of Pennsylvania. He was the author of the earliest scheme for establishing post-offices in the colonies.

HAMILTON, CHARLES S., b. New York, 1822; graduated at West Point; served with credit in the Mexican war, and on the union side in the war of the rebellion, rising to the grade of maj. gen. of volunteers. He resigned two years before the close of the war, and engaged in manufacturing at Fond du Lac, Wis.

HAMILTON, ELIZABETH, 1758-1816; b. Ireland. She was brought up and educated in Scotland by an aunt. In her 15th year she made a tour in the Highlands with some friends and wrote a journal of it for her aunt's perusal, which was inserted, unknown to the author, in a provincial magazine. In 1785 she made her first voluntary contribution to the press in a letter to the *Lounger*. She produced her *Letters of a Hindu Rajah* in 1796, and soon after with her sister, Mrs. Blake, published the *Memoirs of Modern Philosophers*, a satire on the admirers of the French revolution. In 1801-2 the *Letters on Education* appeared, her most valuable though not her most popular work. After traveling through Wales and Scotland for nearly two years, the sisters took up their abode in 1803 in Edinburgh. In 1804 Mrs. Hamilton, as she then preferred to be called, published her *Life of Agrippina, wife of Germanicus*; and in the same year she received a pension from government. About this time she took charge of a widowed Scotch nobleman's family; and to his eldest daughter were addressed *Letters on the Moral and Religious Principle*, published in 1806. Her next publication of importance, *Cottagers of the Glenburnie*, appeared in 1808. This work, to which the author owes most of her fame, is an admirable description of the failings of the Scotch peasantry in their home life. Her subsequent works were a supplement to her *Letters on Education*, under the name of *Popular Essays on the Elementary Principles of the Human Mind*, and *Hints addressed to the Patrons and Directors of the Public Schools*.

HAMILTON, Lady EMMA LYON, 1764-1815; wife of sir William Hamilton, the antiquary. She was the natural child of a servant girl; was employed as nurse, then as sales clerk, then as chambermaid to a titled lady, then as waitress in a tavern, and then for some years she was the mistress of a sea-captain. The captain resigned her to a friend, who deserted her, and she was engaged to represent the figure of the goddess of Hygeia in a quack doctor's show. Her next affinity was Charles Greville, of an old family in Warwickshire; to whom she bore three children. He wanted to marry her but his uncle (sir William Hamilton) opposed the union. But as soon as the uncle saw her he fell desperately in love himself. The nephew then sold her to his uncle, the latter agreeing to pay the former's debts. Not long after sir William married her, and as his wife presented her at the court of Naples. Here she formed a *liaison* with lord Nelson with her husband's connivance. She was concerned in the political conflicts of the time, and obtained possession of a letter written by Charles IV. of Spain to his brother the king of Naples, in which he accused the English of various misdeeds. This letter she sent to London, which act brought on a war in which the English severely punished the Spaniards. Returning to England, the adventuress found a very cold reception, chiefly on account of her relations with Nelson, who had resigned to be constantly at her feet. She had one daughter to whom she gave the name Horatia Nelson. When both husband and lover died she was left poor, and not long after went to France, where she died in want. Her daughter married a clergyman. Lady Hamilton was a remarkably beauti-

ful woman, and so captivated the painter, Romney, that he is said to have represented her in twenty-three of his works.

HAMILTON, GAVIN, 1730-97. At an early age he was sent to Rome, where he studied painting under Massucci. His best pieces are designed from the *Iliad*, such as "Achilles beside the dead body of Patroclus," "Andromache bewailing the Death of Hector," and "Helen and Paris." Hamilton, however, has rendered greater service to art by his discoveries of precious fragments of ancient monuments than by his direct contributions to it. The latter part of his life was devoted to researches of this kind, which he prosecuted in various parts of the Roman states, but especially at Civita Vecchia, Velletri, Ostia, and above all at Hadrian's villa, at Tivoli. The statues, busts, and bas-reliefs found by him form the most interesting portion of the museo Clementino, after the treasures of the Belvidere. Many collections in England, Germany, and Russia, owe their chief ornaments to his labors. To one of the best of these—the Townley gallery—Hamilton contributed a large number of valuable marbles, a list of which is given in the *Townley Gallery*, published by the society for the diffusion of useful knowledge.

HAMILTON, JAMES, 1786-1857; b. S. C.; educated to the law; served in the army during the war of 1812 as a maj. of militia, but afterwards began the practice of his profession. While mayor of Charleston in 1822 he discovered and frustrated a plan for an insurrection of slaves. He was in the South Carolina legislature, and in congress, where he was John Randolph's second in the duel with Henry Clay. In the nullification period, 1830-32, he was governor of South Carolina, and strongly urged the adoption of the nullification ordinance. At a later era he was minister from Texas (before annexation) to England and France, both of which nations acknowledged the independence of the "lone star" republic. He lost his life in a steamboat collision.

HAMILTON, ROBERT, 1743-1829; a Scottish writer on finance, educated at the university of Edinburgh. Although desirous of following a literary life, he entered a banking-house in order to acquire a practical knowledge of business. In 1769 he gave up business pursuits and accepted the rectorship of Perth academy. In 1779 he was presented to the chair of natural philosophy at Aberdeen university. For many years, however, by private arrangement with his colleague, prof. Copland, Hamilton taught the class of mathematics. In 1817 he was presented to the latter chair. For some years before his death he had retired from the active business of his chair, and quitted his privacy only at rare intervals, to take part in important affairs concerning the college. Hamilton's most important work is the *Essay on the National Debt*, which appeared in 1813. A posthumous volume published in 1830, *The Progress of Society*, is also of great ability, treatment of economical principles by tracing their natural origin and position in the development of social life.

HAMILTON, SCHUYLER, b. New York, 1822; grandson of Alexander; graduated at West Point; served (and was twice wounded) in the war with Mexico; resigned from the regular army in 1855; went into the union army as a private in 1861, and in 1862 was maj. gen. of volunteers; was prominent in several engagements. He has published a *History of the National Flag*.

HAMILTON, WILLIAM, 1704-54; a Scottish poet, author of *The Braes of Yarrow*; probably studied at the university of Edinburgh; an associate in years after with Allan Ramsay and Henry Home. As early as 1724 he contributed to Ramsay's *Tea Table Miscellany*. In 1745 Hamilton joined the cause of prince Charles, and, though it is doubtful whether he actually bore arms, he certainly celebrated the battle of Prestonpans in an ode beginning—*As over Gladsmuir's bloodstained field*. After the disaster of Culloden he lurked for several months in the highlands, and at length escaped to France; but in 1749 the influence of his friends at home procured him permission to return to Scotland, and in the following year he obtained possession of the family estate at Bangour.

HAMILTON, SIR WILLIAM, PHILOSOPHY OF, may, within the narrow limits of this article, be most clearly exhibited by a brief outline of his *Lectures on Metaphysics*, given as far as possible in his own language. Philosophy is the study of the nature of things. Its paramount object of consideration is the mind, and, in its stricter meaning, it is limited to the knowledge of mind and of objects relating to that. It has regard to three points: the facts to be observed; the laws which regulate them; and the true results which are to be drawn from them. There are three great classes of mental facts: those of the cognitive faculties, those of the feelings, and those of the will and desire. The laws which regulate the first constitute logic; those which guide the second are called aesthetics; and those which control the third are known as moral and political science. Among the results to be drawn from these facts are proofs of the being of God and of the immortality of man. Psychology is the science conversant with the facts of the mind. All human knowledge, and, therefore, all philosophy are of the relative or conditioned as opposed to the absolute. This is true of matter, certain qualities of which are known; itself, or, as we commonly say, its substance, is unknown. It is true of mind; certain mental states of knowing, feeling, willing, and desiring are known, but

the mind itself is unknown. It is true of existence; certain manifestations of it we know, but of absolute existence we know nothing. Our knowledge of existence is limited by our faculties. Nothing exists *for us* except as it is known to us; and nothing is known to us except certain properties or modes of existence which are analogous to our faculties. Yet, as we are warranted to assert the existence only of what we know, so we are not warranted to deny the existence of what we do not know. The term *mind*, in the rigid employment of it, denotes the self-knowing principle alone. We cannot conceive of mind as existing without consciousness. The term conscious subject is sometimes used as a comprehensive definition of the mind itself or the thinking principle. The great problem of philosophy is to analyze the contents of our cognitions or acts of knowledge; to distinguish what elements are contributed by the mind and what by the object of our knowledge. The general conditions of consciousness are that it is an actual knowledge; is immediate and discriminating; includes judgment; and requires memory. It is co-extensive also with our knowledge. Consciousness is the source of philosophy of mind. The possibility of philosophy implies the veracity of consciousness which as a criterion is naturally clear and unerring. In order to secure the full value of it, three laws for its government must be observed. 1. The law of parsimony. The facts of consciousness adduced must be primary, universal, necessary, and given on the ground of belief only. 2. The law of integrity. The whole facts of consciousness must be taken without hesitation or reserve. 3. The law of harmony. Nothing but the facts of consciousness must be admitted. When all these laws are observed the absolute and universal veracity of consciousness must be maintained. Activity and passivity are always conjoined in manifestations of the mind. The mind is never directly conscious of passivity; is never wholly inactive; and we are never wholly unconscious of its activity. The mind may be unconsciously modified. Our whole knowledge is made up of the unknown and incognizable. There are three principal facts of consciousness: 1. Of self-existence; 2. Of individuality; 3. Of personal identity. There are various cognitive faculties. 1. The presentative, including perception and self-consciousness; 2. The conservative, or memory proper; 3. The reproductive, that is the faculty of recovering the absent thought from unconsciousness; 4. The representative, that is the imagination; 5. The elaborative, that is comparison; consisting of analysis and synthesis, and leading to generalization or conception, to judgment, which is the direct comparison of two things or notions, and to reasoning, which is the comparison of two through a third. This last is thought strictly so called, corresponding to *diánoia*, of the Greek philosophy; *discursus* of the Latin, and *verstand* of the German. Its laws are the object of logic; 6. The regulative faculty, which is reason or common sense. There are cognitions in the mind which are not contingent but necessary, and presupposed by thought as its fundamental condition. They are not derived from experience but are native to the mind, and are the laws by which it is governed. They are similar in character, and are to be collected into a class. To the power possessed by the mind of manifesting these the name regulative faculty is given. It corresponds in some measure with the *nous* of Aristotle's philosophy, with the *vernunft* (reason) in the philosophy of Kant, Jacobi, and other recent Germans; and probably with Reid's, certainly with Stewart's *Common Sense*. Among the uses of philosophy may be specified the fact that it satisfies the conditions of the proof that there is a God. These conditions are: 1. That intelligence is first in the order of existence. 2. That the universe is governed by moral laws. The phenomena of the material world are subjected to immutable laws. The phenomena of man are, in part, subjected to the laws of the external universe. But what he holds of matter do not make up his personality. They are *his* not *he*. He is not an organism, but an intelligence served by organisms. His intelligence reveals principles of action, absolute and universal, in the law of duty. It is only as he is a free intelligence, a moral power, that he is created in the image of God; and it is only as a spark of divinity glows in us, as the life of our life, that we can rationally believe in an intelligent creator and moral governor of the universe. This has been well expressed by Dr. Henry More:

Nullus in microcosmo spiritus
Nullus in macrocosmo Deus.

If there be no moral world there can be, of course, no moral governor; and we have no ground to believe in the reality of a moral world except as we ourselves are moral agents. If therefore we could be convinced that we are not moral agents, we should also be convinced that there is no moral order and no supreme intelligence by which such order is established and maintained. Philosophers have been, in the main, agreed in holding this view. Plato says of some that "reversing in themselves the relative subordination of mind and body, they also in the universe make matter prior to mind; so that, starting with this error in relation to themselves, they end in the subversion of the Godhead." Kant declares, "Two things fill the mind with ever rising wonder and reverence, the starry heaven *above* and the moral law *within*." And Jacobi affirms that we believe in God not by reason of nature which conceals him, but by reason of the supernatural in man, which alone reveals and proves him to exist. And with this judgment of philosophers revelation accords; for it is a revelation to man and concerning man; and man is only the object of revelation inasmuch as he is a moral, free, and

responsible being. In harmony with this view, the Scriptures are replete with testimonies to our natural liberty.

HAMILTON COLLEGE, in Clinton, Oneida co., N.Y., was first chartered in 1812 and graduated its first class in 1814. Its origin is due to the foresight and generosity of the rev. Samuel Kirkland, a missionary for more than 40 years among the Oneida Indians. He founded the "Hamilton Oneida academy" in 1793, and gave its trustees several hundred acres of land, and from this the college was developed. The college grounds comprise 45 acres, on which are grouped the college buildings, consisting of three four-story brick halls, with rooms mainly for students, a chapel, a library, and memorial hall, a hall of natural history, a chemical laboratory, and an observatory. The library contains 12,000 volumes. The observatory, endowed by Edwin C. Litchfield, and bearing his name, is furnished with an equatorial telescope with an object glass 13.5 in. in diameter, and a focal length of almost 16 ft., and various other instruments needed for its equipment. The cabinets contain nearly 2000 specimens in geology, mineralogy, and natural history; and there is besides a herbarium with nearly 1000 samples of plants carefully classified. There is a law department, endowed by W. H. Maynard, with a library of 5,000 volumes, the gift of the late William Curtis Noyes, of New York. The triennial catalogue embraces nearly 2000 names. In the library building there is a memorial hall and an art gallery, designed for tablets, portraits, and other memorials of friends of the college. The productive funds of the institution amount to more than \$250,000, and the real estate and collections are valued at \$300,000. Number of professors, 12; of students, from 150 to 175; president, S. G. Brown, D.D., LL.D.

HAMIRPUR, or **HUMEERPOOR**, a British district in India in the n.w. provinces, forming the s.w. district of the Allahabad division, bounded on the n. by the Jumna; on the n.w. by the native state of Baoni and Betwa river; on the w. by the Dhasan river; on the s. by Alipura, Chhatarpur, and Charkhari states; and on the e. by the Banda district. It incloses the native states of Sarila, Jagni, and Bihat, besides portions of Charkhari and Garrauli. Pop. '72, 529,137. Hamirpur forms part of the great plain of Bundelkhand, which stretches between the banks of the Jumna and the central Vindhyan plateau. The district is in the shape of an irregular parallelogram, with a general slope northward from the low hills on the southern boundary. The scenery is rendered picturesque by the artificial lakes of Mahoba. These magnificent reservoirs were constructed by the Chandel rajas about 800 years ago, for the purpose of irrigation and as sheets of ornamental water. Many of them inclose craggy islets or peninsulas, crowned by ruins of granite temples, exquisitely carved and decorated. From the base of this hill and lake country the general plain of the district spreads northward in an arid and treeless level towards the broken banks of the rivers. Of these the principal are the Betwa and its tributary the Dhasan, both of which are unnavigable. There is little waste land, except in the ravines by the river sides. The deep black soil of Bundelkhand, known as mar, retains the moisture under a dried and rifted surface, and renders the district fertile.

HAMLET. See **AMLETH**, *ante*.

HAMLIN, a co. in e. Dakota formed after 1870; traversed by Big Sioux river; 720 sq. miles. It is mostly level and bare of timber.

HAMLIN, **CYRUS**, D.D., LL.D., b. at Waterford, Me., 1811; graduated at Bowdoin college 1834, and at Bangor theological seminary 1837. In 1838 he went to Constantinople, Turkey, as a missionary under the direction of the American board; and, in this capacity, established the seminary at Bebek in 1840. Having in 1860 resigned his relation to the board, he spent 13 years in establishing and presiding over Robert college, an institution in Constantinople named after its founder, Christopher R. Robert of New York city. While on a visit to the United States engaged in promoting the interests of the college, he accepted the chair of theology in Bangor seminary, to which, in 1877, he was called. In 1880 he was elected president of Middlebury college, Vt., and now holds the office. Bowdoin college and Harvard university have conferred on him the degree of D.D.; and the same college and the university of New York that of LL.D.

HAMLIN, **HANNIBAL**, b. Me., 1809; commenced life as a printer, but studying law was admitted to the bar in 1833; was democratic representative in congress 1843-47, but in 1856 withdrew from his party and in the republican interest accepted the governorship of Maine. In 1860 he was vice-president of the United States; and for a time occupied the position of collector to the port of Boston. In 1869 he was once more elected U. S. senator, and re-elected, 1875.

HAMLIN, **LEONIDAS LENT**, 1797-1865; b. Conn.; studied for the Presbyterian ministry, but afterwards studied law and practiced in Ohio. In 1830, however, he became a preacher in the Methodist church, and in 1840 was chosen assistant editor of the *Western Christian Advocate* and chief editor of the *Ladies' Repository*. In 1844, when the Methodist church divided n. and s. on slavery, he was a member of the general conference, and drew up the plan of separation. He was elected bishop at that session, and served until 1852. His writings are devoted chiefly to the illustration and defense of the Wesleyan doctrine of sanctification.

HAMME, a t. in East Flanders, Belgium, on the right bank of the Durme, near its junction with the Scheldt, 18 m. e.n.e. of Ghent. It contains grain and oil-mills, has manufactures of lace, ribbons, linen, starch, ropes, and cordage, and carries on trade in flax. Pop. '76, 10,778.

HAMMER-PURGSTALL, JOSEPH VON, Baron, 1774-1856; b. Austria; was named von Hammer, and adopted the name by which he is known, on receiving a legacy comprising the estates in Styria, of the countess of Purgstall. Having studied the oriental languages in Vienna, and displaying a surprising facility in their acquirement, he was appointed interpreter to the internuncio at the Porte in 1799, and continued in the Austrian diplomatic service until 1817, when he was made aulic counselor. In 1847-49 he was president of the academy of Vienna. Meanwhile he wrote constantly on all subjects bearing relation to the east and in most of the European languages. He translated from the Arabic, Persian, and Turkish, works hitherto unknown in Europe. He also wrote concerning the eastern races, their antiquities, philology, music, literature, etc. One of his most important works was the *Literaturgeschichte der Araber*. He also wrote the *Geschichte der Assassinen* and *Geschichte der Osmanischen Dichtkunst*. At the period of his death, at 82 years of age, this remarkable man retained his buoyancy of mind, and he pursued his industrious habits to the last.

HAMMOND, EDWARD PAYSON, b. Conn., about 1835; an evangelist, graduated at Williams college in 1858, studied at the Union theological seminary in New York, and going to Ireland in 1859, became conspicuously active in the religious revival then in progress at Ballymena, near Belfast. He continued his studies at the university of Glasgow, where he graduated in theology in 1861, having meanwhile become widely distinguished for evangelistic work in Scotland, England, and Wales. Returning to America in 1861 he carried on a revival work with great success in Portland, Me.; and since then has been widely known in evangelistic work in all parts of the United States and Canada. He has a residence in his native town, Vernon, Conn., to which he retires in the seasons of rest from revival work. He has at different times traveled widely in Europe and Palestine, and is the author of some books for children, and the compiler of hymn books used in his meetings.

HAMMOND, JAMES HAMILTON, 1807-64; b. S. C.; graduated from South Carolina college, was admitted to the bar, and in 1830 was the editor of the *Southern Times*, published at Columbia. He was an advocate of nullification. In 1835 he was in congress, and in 1842 was governor of South Carolina. He wrote on the side of slavery in answer to Thomas Clarkson's attacks, *The Pro-Slavery Argument*, and also many essays on agriculture, finance, etc. He was U. S. senator in 1857, and the next year proclaimed in his speeches that northern laborers were "the mudsills of society," and that "cotton is king, and no power on earth dare make war upon it." Naturally he went with his state in the rebellion, and left his place in the senate.

HAMMOND, SAMUEL, 1757-1842; b. Va.; while a boy he served in wars against the Indians, and in 1775 raised a company in support of the revolution. He was in the fight at Stono Ferry and in other engagements in the south. In 1793 he led a regiment against the Creek Indians in Georgia. In 1805 he was military commander of upper Louisiana; in 1831 secretary of the state of South Carolina.

HAMMOND, WILLIAM ALEXANDER, b. Md., 1828; graduated in medicine at the New York university in 1848; the next two years was assistant surgeon in the regular army; and in 1860 professor of physiology and anatomy in Maryland university. In 1861 he re-entered the military service as assistant surgeon, and in 1862 was appointed surgeon-general. In 1864 he became professor of mental and nervous diseases and of clinical medicine in Bellevue hospital medical college, New York, and physician-in-chief for diseases of the nervous system in New York state hospital. Dr. Hammond has published a number of valuable works, among which are *A Treatise on Hygiene, with special reference to Military Science; Physiological Memoirs; Lectures on Venereal Diseases; On Wakefulness with introductory chapter on Sleep; Insanity in its Medico-legal Relations; Sleep and its Derangements; Physics and Physiology of Spiritualism; Treatise on Diseases of the Nervous System; Insanity in its Relations to Crime*, etc., besides editing *Medical and Surgical Essays*, and translating Meyer's *Electricity in its Relations to Practical Medicine*.

HAMON, JEAN LOUIS, 1821-74; a French painter. At an early age he was destined to the priesthood, but his strong desire to become a painter finally triumphed over family opposition, and in 1840 he repaired to Paris. Here he received valuable counsel and encouragement from Delaroche and Gleyre, and in 1848 he made his appearance at the *salon* with "Le tombeau du Christ," and a decorative work, "Dessus de Porte." His paintings, up to 1849, had attracted little public notice, and he was content to accept a place in the manufactory of Sevres, but an enameled casket by his hand having attracted attention at the London international exhibition of 1851, he received a medal, and, re-inspired by success, left his post to try his chances again at the *salon* of 1852. "Le Comédie Humaine," which he then exhibited, turned the tide of his fortune, and "Ma soeur n'y est pas" (purchased by the emperor) obtained for the artist a third-class medal. At the Paris international exhibition of 1855, when Hamon re-exhibited the casket of

1851, together with several vases and pictures, of which "L'Amour et son Troupeau," "Ce n'est pas moi," and "Une Gardeuse d' Enfants," were the chief, he received a gold medal of the second class, and the ribbon of the legion of honor. In the following year he was absent in the east, but in 1857 he reappeared with "Boutique à quatre Sous," "Papillon enchainé," "Cantharide esclave," "Dévotionnaires," etc., in all, ten pictures; "L'Amour en visite" was contributed to the *salon* of 1859, and "Vierge de Lesbos," "Tutelle," "La Volière," "L'Escamoteur," and "La Souer aînée," were all seen in 1861. Hamon now spent some time in Italy, chiefly at Capri, whence in 1864 he sent to Paris "L'Aurore, Un Jour de Fiançailles." The influence of Italy was also evident in "Les Muses à Pompéi," his sole contribution to the *salon* of 1866, a work which enjoyed great popularity and was re-exhibited at the international exhibition of 1867; together with "La Promenade," and six other pictures of previous years. His last work, "Le triste Rivage," appeared at the *salon* of 1873. It was painted at St. Raphael, where Hamon had finally settled in a little house on the shores of the Mediterranean, close by Alphonse Karr's famous garden. Hamon was remarkable for delicacy of coloring, as well as for effective grouping and general composition.

HAMPDEN, a co. in w. central Massachusetts, on the Connecticut, Westfield, Chicopee, and Swift rivers, crossed by the New Haven and Northampton, the New London, Northern, and the Connecticut River railroads; 620 sq. m.; pop. '80, 104,117. The surface is diversified with hills and valleys. There is plenty of timber, and water power is abundant. The chief productions are corn, tobacco, hay, and butter. Co. seat, Springfield.

HAMPDEN, RENN DICKSON, D.D., 1793-1868; bishop of Hereford; b. Barbadoes; educated at Oxford. Having left the university in 1816, he held successively the curacies of Newton, Faringdon, and Hackney, and in 1827 he published *An Essay on the Philosophical Evidence of Christianity*, followed by a volume of *Parochial Sermons illustrative of the importance of the Revelation of God in Jesus Christ*. In 1828 he returned to Oxford as tutor of Oriel, and after having twice acted as public examiner in classics, he was selected to preach the Hampton lectures in 1832, when he chose for his subject *The Scholastic Philosophy considered in its Relation to Christianity*. Notwithstanding a charge of Arianism, he became principal of St. Mary's hall, and professor of political economy, and in 1836 regius professor of divinity. There resulted a widespread and violent though ephemeral controversy, after the subsidence of which he published a *Lecture on Tradition*, which has passed through several editions, and a volume on *The Thirty-nine Articles of the Church of England*. His nomination by lord John Russell to the vacant see of Hereford in Dec., 1847, was again the signal for a violent and organized opposition; and his consecration in Mar., 1848, took place in spite of a remonstrance by many of the bishops and the resistance of Dr. Merewether, the dean of Hereford, who went so far as to vote against the election when the *congé d'élire* reached the cathedral. Among the more important of his later writings were the articles on Aristotle, Plato, and Socrates, contributed to the eighth edition of the *Encyclopædia Britannica*, and afterwards reprinted with additions under the title of *The Fathers of the Greek Philosophy* (Edinburgh).

HAMPDEN-SIDNEY COLLEGE, in Prince Edward co., Va., founded in 1775. Among the early trustees were Patrick Henry and James Madison. Rev. Samuel Stanhope Smith was the first president, succeeded by rev. John Blair Smith, rev. Archibald Alexander, and rev. Moses Hoge. At present J. M. P. Atkinson, D.D., is the presiding officer. There is no preparatory school, nor any professional school. Diplomas are awarded only to students who have passed through the full course prescribed.

HAMPSHIRE, a co. in w. central Massachusetts, intersected by the Connecticut, Chicopee, Westfield, and Swift rivers, and by the New Haven and Northampton, the New London Northern, and the Connecticut river railroads; 600 sq. m.; pop. '80, 47,235. The surface is hilly and the soil fertile; chief productions: corn, hay, tobacco, etc. There are many manufacturing establishments. Co. seat, Northampton.

HAMPSHIRE, a co. in e. West Virginia, s. of the Potomac, intersected by the Cacapon river and reached by the Baltimore and Ohio railroad; 640 sq. m.; pop. '70, 7,643—640 colored. The surface is rough and to a large extent covered with forests. Corn, wheat, and hay are the main products. Iron is found. Co. seat, Romney.

HAMPTON, a t. in Rockingham co., N. H., on the Eastern railroad, 47 m. n.e. of Boston; pop. 1177. The place was settled in 1638 near a block-house which was put up two years before to mark the n.e. boundary of Massachusetts. The settlers, chiefly from Norfolk, England, were long subjected to Indian troubles. It is now a thriving and handsome village. Three m. to the s.e., on the ocean, is Hampton beach, a watering-place of wide repute. Here is Boar's Head, a cliff 70 ft. above tide, affording magnificent marine views. On the s. are all kinds of large and small beaches all the way to cape Ann. Mt. Agamenticus is seen to the n. beyond the village of Rye, and the isles of Shoals are off-shore to the n.e. The beach at Hampton affords excellent facilities for bathing, promenade, and driving.

HAMPTON, WADE, 1754-1835; b. S. C. He was a bold and distinguished partisan under Marion and Sumter in the war of the revolution. In 1795 he was in congress, and

was re-elected in 1802. In the war with Great Britain (1812-15) he was a maj.gen. He was very obnoxious to other officers, because of his overbearing disposition. At one time he was the owner of 3,000 slaves.

HAMPTON, WADE, b. S. C., 1818. He is the grandson of the great slaveholder, and inherits much of the father's rashness. Graduated at the state university he became a lawyer, and was at an early age in the legislature. In the war of the rebellion he was one of the confederate leaders in command of the Hampton legion (cavalry), and was wounded at Bull Run. Rising to the rank of brig.gen. he was in the battle of Seven Pines, and again wounded. Still another wound was received at the battle of Gettysburg. In 1864 he was made lieut.gen., and in 1865 he was in command of the rear-guard at Columbia, S. C., when a great part of that city was destroyed by fire. In 1877 he became governor of South Carolina, after a long dispute whether he or gov. D. H. Chamberlain was rightfully entitled to that office. He was chosen again governor in 1878, and the same year was elected to the U. S. senate to serve six years, from Mar. 4, 1879.

HAMPTON NORMAL AND AGRICULTURAL INSTITUTE, for the instruction of negro and Indian pupils, stands on the e. shore of Hampton creek, a little below the town of Hampton, Va., $2\frac{1}{2}$ m. from fortress Monroe, on an estate of 190 acres, once known as "Little Scotland." It owes its existence to the American missionary association, which purchased this estate in 1867 and opened a school on the manual labor basis in 1868. The labor of its organization was largely devolved on its enthusiastic and indefatigable principal, Samuel C. Armstrong, who early succeeded in gathering an unusually zealous and efficient company of teachers and helpers. The place was selected for its natural beauty and healthiness, as well as for its accessibility, and partly also because it is surrounded by a numerous colored population. In 1870 the institution received a charter from the state of Virginia, and it is now controlled by a board of trustees, with power to choose their successors, the property having been transferred to them upon condition that the religious teaching of the school shall be evangelical. It is neither a college nor a university, but a school adapted to the immediate needs of the colored population of the southern states, the managers, of course, having power at any time to enlarge its scope as circumstances may require. It has invested funds amounting to \$79,814. Its income from all sources, including the interest of the state agricultural land fund (\$10,000), interest of invested funds (\$2,500), and voluntary contributions, is from \$30,000 to \$35,000 annually. Several of its buildings were burned in Nov., 1879, and are not yet wholly replaced, but will be ere long. The principal structures are academic hall, of brick, 110 by 70 ft., in the form of a Greek cross, used for school and recitation rooms, and boys' sleeping-rooms; Virginia hall, of brick, 192 by 40 ft., with central wing extending 100 ft. in the rear, used for girls' and teachers' rooms, and containing also a large chapel, students' dining-hall, laundries, kitchens, printing-office, knitting-room, etc. The smaller buildings are two cottages for boys' rooms, wigwam for the use of Indian students, dwelling-houses for managers and teachers, barns and out-houses, ice-house, saw-mill, engine-house, and the Butler school-house. The institute also owns a farm of 339 acres, called "Shellbanks," on Back river, 7 m. from the school. This farm—the gift of a friend—is used for keeping and raising stock, and, in summer, for an Indian camp, and the labor upon it is mainly performed by the students, the institution being founded on the manual labor plan. The laboratories and apparatus were destroyed by fire in 1879, and have been only partially replaced. The museum, with its collections, and the library also, have been greatly injured by fire. The latter contains 600 volumes, and embraces a reading-room, where from 50 to 80 periodicals and newspapers are kept on file for the use of the students. A monthly periodical, *The Southern Workman*, devoted to the industrial classes of the south, is printed on the grounds, affording occupation for some of the students and an admirable vehicle for advertising the advantages of the school. The departments of instruction are two, academic and industrial, the former embracing a three years' course of English branches, including mathematics through algebra, with intellectual philosophy, civil government, political economy, book-keeping, history, English literature and composition, natural philosophy, chemistry, and practice in teaching. In the industrial department instruction is given in farming and in the following mechanical branches: carpentry, shoemaking, blacksmithing, tailoring, iron and tin-work, housework, cooking, and sewing and knitting by machine. The school has a military organization, as required by the act of congress appropriating the land-fund; an officer of the army being detailed by the government to give instruction. Calisthenic exercises are taught in the senior class to boys and girls alike, both sexes being admitted to the school on equal terms. Pupils on entering are only required to have a knowledge of the primary rules of arithmetic and to be able to read and write, and there is a primary department in which so much is taught. The whole number of pupils up to 1880 is 1429; of these 353 have graduated, and not less than 90 per cent of the number have devoted themselves to the work of teaching those of their own color, thus fulfilling one of the great objects of the institution, which is to raise up teachers for the free schools of the south. From 10,000 to 20,000 colored children were taught by these graduates in 1879-80, and their work is highly prized by the educational directors of the south. Since 1878 the institute has

had as pupils a considerable number of Indian children and youth, sent thither by direction of the Indian department in Washington, and the results of this effort to instruct them in the elements of civilized life are thus far of the most satisfactory character. The principal of the institute bears testimony to the safety and advantages of educating the sexes together.

HAMPTON ROADS (Hampton, *anté*), the lower part of an expansion of James river, Va., where it falls into Chesapeake bay. It is an important military point, and is defended by forts Wool and Monroe. The light at the entrance from the sea is in 37° 42' n., and 76° 14' w. During the war of the rebellion there were two naval engagements in and near Hampton Roads. Mar. 8, 1862, the frigate *Congress*, the sloop-of-war *Cumberland*, the steam frigates *Minnesota* and *Roanoke*, and the ship *St. Lawrence* were in the roadstead, when the *Virginia*, an iron-clad confederate craft, formerly the U. S. steam frigate *Merrimac*, which had been seized the year before, attended by two small steamers, came from Norfolk, passed rapidly by the *Congress*, exchanging broadsides, and ran directly into the *Cumberland*, which sunk in less than three-quarters of an hour. The *Congress* was disabled and set on fire, and eight hours later her magazine exploded. The other union vessels escaped. The union loss was 286; that of the confederates only about a dozen. The next day the union iron-clad *Monitor*, the first turret vessel ever used, appeared on the scene, and between her and the *Virginia* a long action ensued. The *Monitor* could not be run down nor boarded, and near night the *Virginia* gave up the fight and retired to Norfolk, leaving the strange little steamer unharmed.

HANCOCK, a co. in e. central Georgia, on the Ogeechee and Oconee rivers, intersected by the Macon and Augusta railroad; 500 sq. m.; pop. '80, 16,989—11,944 colored. The surface is uneven, and much of it is covered with forests. The soil is tolerably fertile, producing corn, cotton, etc. Various minerals are found. Co. seat, Sparta.

HANCOCK, a co. in w. Illinois, on the Mississippi, intersected by the Toledo, Peoria, and Warsaw, the Burlington and Quincy, and the Wabash railroads; 750 sq. m.; pop. '70, 35,935. It has an undulating surface of prairie and woodland, and the soil is very fertile. Corn, wheat, butter, and pork are the chief productions. Co. seat, Carthage.

HANCOCK, a co. in e. central Indiana, drained by Big Blue river, intersected by the Pittsburg, Cincinnati, and St. Louis, and the Cincinnati, Hamilton, and Dayton railroads; 300 sq. m.; pop. '70, 15,123. It is level, and about a third as yet timber-land. Chief productions: wheat, corn, and oats. Co. seat, Greenfield.

HANCOCK, a co. in n. Iowa, intersected by Boone and Iowa rivers, and the Milwaukee and St. Paul railroad; 576 sq. m.; pop. '75, 1482. The soil is fertile, producing corn, oats, etc. Co. seat, Concord.

HANCOCK, a co. in n.w. Kentucky, on the Ohio river; 200 sq. m.; pop. '70, 6,591—729 colored. It has an undulating and in some parts rough surface. Corn and tobacco are the main crops. Co. seat, Hawesville.

HANCOCK, a co. in s.e. Maine, on the ocean, drained by Penobscot and Union rivers, and including a large number of islands, of which Mt. Desert is the most important; 1700 sq. m.; pop. '70, 36,495. There are many ocean inlets affording good harbors, and in the interior there are numerous lakes and large forests. Butter and lumber are the chief products. Co. seat, Ellsworth.

HANCOCK, a co. in s.w. Mississippi, bordering on Louisiana and the gulf of Mexico; 500 sq. m.; pop. '70, 4,239—1186 colored. Surface level, soil poor. Co. seat, Bay St. Louis.

HANCOCK, a co. in n.w. Ohio, intersected by a branch of Auglaize river, the Lake Erie and Louisville, and the Cincinnati, Sandusky and Cleveland railroads; 525 sq. m.; pop. '70, 23,487. Surface level, with plenty of good timber; the soil a calcareous loam, producing wheat, corn, oats, etc. Co. seat, Findley.

HANCOCK, a co. in n.e. Tennessee, on Clinch river and the Virginia border; 300 sq. m.; pop. '70, 7,148—585 colored. It has a rough and mountainous surface, but the valleys are fertile, producing corn, wheat, pork, etc. Co. seat, Sneedsville.

HANCOCK, a co. in n. West Virginia, a narrow strip between the Pennsylvania line and the Ohio river; 90 sq. m.; pop. '70, 4,363—27 colored. The surface is uneven; soil is fertile, producing corn, wheat, oats, etc. Co. seat, Fairview.

HANCOCK, JOHN, 1737—93; b. Mass., graduated at Harvard, and went into commercial business with an uncle who (in 1764) left him a fortune. In 1766 he was a member of the colonial legislature. Two years afterwards a sloop owned by him, bearing the offensive name of *Liberty*, was seized by the crown officers, and the event created a riot in which the officers were roughly treated. After the Boston massacre Hancock was one of a committee to wait upon the governor and demand that the troops should be taken away from the city. Over the remains of the victims of the massacre he made an oration of great eloquence and greater boldness, which gave serious offense to the royal government, and led to an effort to seize the persons of Hancock and Samuel Adams, an effort which was the cause of the conflict at Concord. The provincial congress met at Concord in March, 1873, and both Adams and Hancock were members, the

latter being president. The congress adjourned April 15, and on the night of the 18th men from Boston marched to Concord, arriving at 7½ A.M. on the 19th. A conflict followed, and ended in the battle of Lexington, and the beginning of the revolution. Hancock and Adams escaped, but both were by name exempted from the pardon promised by governor Gage. Hancock was president of the continental congress, and his name in a bold hand stands first among the signers of the declaration of independence, to which it was appended a month before the other signatures. He was in the Massachusetts constitutional convention, and the first governor of the new state, being (with a single interval) re-elected every year until his death. Much of his large fortune was spent for benevolent and useful purposes, Harvard college coming in for a share.

HANCOCK, WINFIELD SCOTT, b. Penn., 1824; graduated at West Point in 1844, and was for two years on the w. frontier in service. He was also in the Mexican war, and received the brevet of first lieut. for his behavior in the actions at Contreras and Churubusco. After that war he was about 10 years on frontier service in connection with the Indian troubles in Florida and the Mormon dissensions in Utah. In 1859 he was made quarter-master, doing duty in California, and by his energy and personal influence did much to keep that state within the union in 1860-61. Being ordered to Washington, at his own request, he was appointed brig.gen. of volunteers, and was prominent in the battle of Williamsburg and the engagement at Frazer's Farm. He was also in the contests of South Mountain and Antietam, in the latter fight being made a division commander on the field, soon after which he was promoted to maj.gen. At Fredericksburg and at Chancellorsville he was in command of the first division, 2d army corps, and was made corps commander (2d) in June, 1863. At Gettysburg he was in command at the point (on the left center) most furiously assailed by the confederates, and received a severe wound just at the close of the last day's fight. Congress voted special thanks for his gallantry on that occasion. The wound kept Hancock out of the field for nearly a year, but in 1864 he participated in the conflicts of the Wilderness, of Spottsylvania court-house, and Cold Harbor. In Nov. he organized at Washington the first corps of veterans. In recent years he has had department commands, the middle military division, the 5th military district, including Louisiana and Texas (1867-68), that of Dakota, and, since the death of gen. Meade, the department of the east, with head-quarters at Governor's island, New York. In 1868 the democrats were inclined to make Hancock their candidate for president, but Horatio Seymour received the nomination. In the democratic national convention of 1880 Hancock was named, and had 171 votes on the first ballot (493 necessary for a choice), on the second ballot 319, when the nomination was made unanimous, and he was accepted as the leader of the party against the republican candidate, Hon. James A. Garfield; but in the election in Nov. he failed to receive a majority of the electoral votes.

HAND, a co. in s.e. Dakota, organized after 1870; 1,000 sq.m.; very little settled. The streams are affluents of the Missouri and the Dakótah.

HANDLEY, GEORGE, 1752-1793; a native of England who came to Georgia and served in the patriot army in the revolutionary war. He was governor of Georgia and held a number of less important offices.

HANIFAH, called also ABU-HANIFAH, 699-767; an Arabian, and founder of the Hanifites, the oldest of the sects of Mohammedans considered orthodox. Because he opposed the caliph's persecution of the people of Mosul he was forced to poison himself. He was the author of a commentary on the Koran.

HANNIBAL (*ante*), a city in Marion co., Mo., on the Mississippi, about 150 m. above St. Louis, the terminus of the Hannibal and St. Joseph, and the Missouri, Kansas and Texas railroads; has communication with St. Louis, by the river, and by the St. Louis, Keokuk and Northwestern, and with the c. by the Wabash railroad; pop. about 15,000. The inhabitants are extensively engaged in manufacturing, and there is a large trade in lumber and produce. Here is the seat of Hannibal college (Meth. Epis. South), founded in 1868.

HANNO, called the great, d. 202 B.C.; a Carthaginian general. In the first Punic war he captured Hecatompylus. With Hamilcar he was victorious over the mercenaries, and when war was over he was the leader of the aristocratic party, and opposed Hamilcar and his sons.

HANOVER, a co. in e. central Virginia, between Chickahominy, Pamunkey and North Anna rivers, intersected by the Chesapeake and Ohio, and the Richmond, Fredericksburg and Potomac railroads; 400 sq.m.; pop. '70, 16,455—8,562 colored. It has a hilly surface, with much forest land; productions: corn, oats, and tobacco. Co. seat, Hanover Court House.

HANOVER, a t. in Jefferson co., Ind., near the Ohio river, 6 m. w.s.w. of Madison; pop. of township, 1399. It is the seat of Hanover (Presbyterian) college, founded in 1833.

HANOVER COURT-HOUSE, Battle of. See Chickahominy.

HANSEN, PETER ANDREAS, 1795-1874; a Danish astronomer; when young apprenticed to a watchmaker; afterwards employed by Schumacher, professor of astronomy at Copenhagen, to assist in the measurement of an arc of meridian in Hol-

stein. This led to his appointment as assistant to Schumacher, at the observatory of Altona. Hansen's reputation as a mathematician had by this time become generally known, and in 1825 he was selected to succeed professor Encke as director of the observatory of Seeberg, near Gotha. There he remained for the rest of his life, devoting his talents to the development of the highest branches of mathematical astronomy, with an originality of conception which was acknowledged by the English royal astronomical society on two occasions, by the award of their gold medal for his researches in physical astronomy and his lunar tables. His *Tables de la Lune* appeared in 1857, published at the expense of the British government, which awarded him a prize of £1000; they have been adopted for use in the calculations of the *Nautical Almanac*. In addition to this important volume containing the full details of the formulæ explanatory of his lunar theory, Hansen was the author of a large number of miscellaneous papers, principally relating to the orbits of comets and planets or to perturbational astronomy. In one of these he was the first to point out that Encke's value of the horizontal equatorial solar parallax required to be increased to reconcile the lunar theory with modern observations—an opinion which was subsequently confirmed by Le Verrier from his planetary researches and by the observations of Mars and the transit of Venus of 1874. Hansen was a foreign member of the royal society, and an associate of the royal astronomical society.

HANSON, a co. in s.e. Dakota traversed by the Dakota river; 432 sq.m.; formed since 1872. The soil is fertile. Co. seat, Rockport.

HANTS, a co. in central Nova Scotia on Mines basin; 1175 sq.m.; pop. '72, 21,301. It has a varied surface of mountains, hills, and valleys. Gypsum abounds in great quantities. Chief town, Windsor.

HANWAY, JONAS, 1712-86; an English traveler. In 1743 he became a partner with Mr. Dingley, a merchant in St. Petersburg, and in this way had his attention turned to the trade between Russia and Persia, in which latter country he traveled considerably, meeting with many misfortunes. The latter part of his life was for the most part spent in London, and his leisure was devoted to the advocacy and support of useful enterprises. He is popularly remembered as the first Englishman to carry an umbrella in his native country; this he persisted in using in spite of all the efforts of the hackney coachman to hoot or hustle him into conformity. He wrote with some effect against the custom of giving vails, or gratuities to servants; and in his *Journey from Portsmouth to Kingston* he attacked the habit of tea-drinking, which, however, found an able and ardent defender in Dr. Johnson. In 1757 he took an active part in founding the Marine society, the object of which was to fit out poor boys and men for the navy; he was one of the originators of the Magdalen hospital; it was due to his continued efforts that the act of George III. was passed for the better treatment of the parish infants; and in 1785 he took up the lamentable case of those little chimney-sweeps whose dangerous occupation is now a thing of the past. The method of solitary confinement for prisoners found in him one of its earliest advocates, and in various other ways he sought to improve the chances of the criminal population.

HAPLOMI. See ESOCIDE, MALACOPTERYGII, and PIKE, (*ante*).

HARAFORA, or ALFOOROO, a tribe of savages in the island of Celebes and also in Papua or New Guinea, somewhat resembling the Malays, but having crisp instead of straight hair. They clothe themselves with the inner bark of trees made flexible by pounding. The fighting men are armed with shields and cleavers. One of their barbarous customs prescribes that a young man shall not marry until he has cut off a human head; the order of importance being—first, a man's head, then that of a woman, and lastly, a child's; but the greatest trophy is the head of a white man. The result of this butchery is that in some places the skulls accumulated through this custom far outnumber the people living. They have some traditions of a god, and of a religion derived probably from the Mohammedans. They live in the most primitive huts, and have no considerable village.

HÁRA-KIRI (see HARRI-KARI, *ante*). From *hara*, belly, and *kiri*, to cut. The Japanese method of suicide for men only, women never using this method. With the abolition of the custom of wearing two swords, hara-kiri is rapidly falling into desuetude, and is practiced only in rare cases. The object of hara-kiri was to sever the large artery in front of the spine, and thus secure speedy death.

HARALSON, a co. in n.w. Georgia, on the Alabama border, drained by the Tallapoosa river; 400 sq.m.; pop. '70, 4,004—319 colored. The surface is hilly and largely covered with forests. Corn and cotton are the chief productions. Co. seat, Buchanan.

HARAN, or CHARRAN, a district in the n. of Mesopotamia, and a t. 10 m. s.e. of Edessa on the river Belik, 50 m. n. of the junction with the Euphrates. The town is immediately on the highway between Arrapachitis and Canaan, and at the point where the highway is crossed by the great western road connecting Media, Assyria, and Babylonia with the Cilician coast. For the Assyrians it became a strategic position of first-rate importance, and in this respect it is mentioned in inscriptions as early as the time of Tiglath Pileser I., about 1100 B.C. It also, for the same reason, ultimately became the center of considerable commerce, one of whose specialties particularly named was

the odoriferous gum derived from the strobilus. It was here that Crassus in his eastern expedition was attacked and slain by the Parthians; and here also the emperor Caracalla was murdered at the instigation of Macrinus, 217 A.D. Herodian mentions the town as possessing in his day a temple of the moon; in the middle ages it is referred to as having been the seat of a particular heathen sect, that of the Haranite Sabeans. It retained its importance down to the period of the Arab ascendancy; but by Abulfeda it is mentioned as having before his time fallen into decay. It is now wholly in ruins. According to patriarchal history, Haran was the first resting-place of Terah and his family, after their migration from Ur of the Chaldees, and here Terah and Nahoe remained when Abraham and Lot passed on to Canaan.

HARBAUGH, HENRY, D.D.; 1817-67; b. Penn.; when young was a farmer, a carpenter, a miller, and a teacher. He studied at Marshall college and in 1843 became pastor of a German reformed church, and in 1864 professor of theology in Mercersburg seminary, where he was the chief exponent of the Mercersburg theology. From 1850 to 1866 he was the editor of the *Guardian*, a monthly magazine, and afterwards of the *Mercersburg Review*. He published some poems in the Pennsylvania Dutch dialect. Among his other works are *Heaven*; *The Heavenly Recognition*; *Heavenly Home*; *Life of Michael Schlatter*; *The Fathers of the German Reformed Church*; *Christological Theology*, and an illustrated work on the *Birds of the Bible*.

HARBORS (*ante*). On the U. S. sea-coast nearly all harbors are natural, the only conspicuous exception being that at Lewes, Del. (See **BREAKWATER**.) The chief harbors on the Atlantic coast are Eastport, Machias, Belfast, and Portland in Me.; Portsmouth, N. H.; Newburyport, Salem, Boston, Barnstable, and New Bedford, Mass.; Newport, R. I.; New London, and New Haven, Conn.; New York (the most ample and important harbor on the continent); Perth Amboy, N. J.; Lewes, Del.; Baltimore, Md.; Norfolk, Va.; Newbern and Wilmington, N. C.; Charleston and Port Royal, S. C.; Savannah and Brunswick, Ga.; Fernandina, Key West, and Pensacola, Fla.; the latter on the gulf of Mexico; also on or near the gulf, Mobile, Ala., New Orleans, La., and Galveston, Tex. On the Pacific are San Diego, Santa Barbara, Monterey, and San Francisco, Cal.; Astoria, Or.; Port Townsend, Wash. Ter.; and Sitka, Alaska. There are many ports of less commercial importance but still having some trade. On the great lakes much has been done to improve natural or make small artificial harbors. In a business view Chicago, on lake Michigan, is the most important of the interior harbors. Here a shallow river has been deepened and some artificial means of protection are employed in the form of breakwaters. Nearly the same course has been pursued at Oswego on lake Ontario, and at Buffalo and Dunkirk on lake Erie, and a harbor of refuge is in progress on the w. side of lake Huron. There are 70 harbors on the lakes, most of which are in part artificial.

HARBOR GRACE, a port of entry on the w. side of Conception bay, Newfoundland, next to St. John, the most important t. in the island; pop. 6,770. The harbor is large, but greatly exposed to the sea; the wharves are protected by the beach. The place has a large trade. The most conspicuous edifice is the Roman Catholic cathedral, the seat of an archbishop.

HARCOURT, SIR WILLIAM GEORGE GRANVILLE VERNON, LL.D., b. England 1827; graduate at Trinity college, and took up the practice of law. In 1866 he was appointed queen's counsel. He was returned to the house of commons for the city of Oxford in the Liberal interest in 1868. He was elected professor of international law in the university of Cambridge in 1869. He was a member of the royal commission for amending the neutrality laws, and of the royal commission for amending the naturalization laws. He was appointed solicitor-general in 1873, and held that office until the resignation of Mr. Gladstone's administration. He was one of the original contributors to the *Saturday Review*, and has written various political pamphlets and letters on international law in the *Times*, under the pseudonym of "Historicus." The latter were reprinted in a volume, with considerable additions. He married first Thérèse, daughter of lady Thérèse Lewis; and secondly, in 1876, Mrs. Ives, daughter of the late John Lothrop Motley. He is home secretary in Mr. Gladstone's present cabinet (1880).

HARDEE, WILLIAM J., 1818-73; b. Ga.; graduated at West Point, served with bravery in the Florida and Mexican wars; was on the frontier for several years; then teacher of tactics at West Point, and in 1860 was made lieutenant of cavalry. He went with the confederates in the war of the rebellion, and surrendered to the union forces in North Carolina along with Johnston's army, just at the close of the war. He is best known for a work on *Rifle and Light Infantry Tactics*, largely copied from French authorities.

HARDEMAN, a co. in s.w. Tennessee bordering on Mississippi, intersected by Big Hatchee river, and by the Memphis and Charleston, and the New Orleans, St. Louis and Chicago railroads; 760 sq.m.; pop. 70, 18,074-6,874 colored. Level with fertile soil; main products: cotton, corn, lumber, and pork. Co. seat, Bolivar.

HARDEMAN, a co. in n. Texas on Red river adjoining the Indian territory, organized after the census of 1870, and still unsettled.

HARDHACK. See SPIRÆA, *ante*.

HARDHEAD. See MENHADEN, *ante*.

HARDIE, JAMES ALLEN, b. N. Y. 1823; graduated at West Point in 1843, and entered the artillery service. During the war of the rebellion he accompanied McClellan as aid-de-camp in the Maryland campaign, distinguished himself in the Rappahanock campaign, and was delegated to special duty in the war department. In 1866 he proceeded as senior member of commission to inspect the forts and arsenals of the union, and was more than once auditor of military claims. He has published several military reports, and has contributed to several leading periodicals.

HARDIN, a co. in s.e. Illinois on the Ohio river; 175 sq.m.; pop. '70, 5,113. It has a rough surface and fertile soil; productions: corn, wheat, oats, etc. Co. seat, Elizabethtown.

HARDIN, a co. in n. central Iowa, intersected by the Dubuque and Sioux City, the central Iowa, and the Illinois Central railroads, and the Iowa river; 576 sq.m.; pop. '75, 15,029. It has an undulating surface of prairie and woodland; chief productions: wheat, corn, oats, hay, and pork. Co. seat, Eldora.

HARDIN, a co. in n. central Kentucky bounded e. by Salt river, and for a short distance on the n. by the Great Southern, and the Paducah and Elizabethtown railroads; 550 sq.m.; pop. '70, 15,705-2,276 colored. The surface is hilly and to a great extent covered with forests. Chief productions: corn, wheat, oats, and tobacco. Co. seat, Elizabethtown.

HARDIN, a co. in n.w. Ohio, on Scioto river, intersected by the Cincinnati, Sandusky and Cleveland, and the Pittsburg, Fort Wayne and Chicago railroads; 480 sq.m.; pop. '70, 18,714. The surface is level and there is much forest-land. Wheat, corn, hay, oats, and pork are the chief products. Co. seat, Kenton.

HARDIN, a co. in s. Tennessee, intersected by Tennessee river, which is navigable for steamers; 600 sq.m.; pop. '70, 11,768-1447 colored. Much of the land is covered with timber. Chief productions: cotton, corn, and pork. Co. seat, Savannah.

HARDIN, a co. in s.e. Texas, bounded by the Neches river; 900 sq.m.; pop. '70, 1460-242 colored. Very little of the soil is under cultivation, but corn, cotton, sugar, and rice are produced. Co. seat, Hardin.

HARDIN, JOHN, 1753-92; b. Va.; served in a rifle corps in the revolutionary war. In 1790 he served in the Indian wars under Harmar, and two years later was killed under a flag of truce by Indians, who coveted his horse and equipments.

HARDING, CHESTER, 1792-1866; b. Mass.; a portrait painter. He was of a family in reduced circumstances, worked on a farm and with a chair-maker, and afterwards with a house-painter. With the ordinary paints of the business he attempted portraits, and was not long in finding his true calling. In 1823 he went abroad and studied for three years. Among those whose portraits he painted were Madison, Monroe, J. Q. Adams, chief-justice Marshall, Charles Carroll, William Wirt, Clay, Webster, Calhoun, Washington Allston, Samuel Rogers, lord Aberdeen, the dukes of Norfolk, Hamilton, and Sussex, and Daniel Boone.

HARDINGE, CHARLES STEWART, Viscount, b. England, 1812; graduated at Oxford; represented Downpatrick in the house of commons from 1854 to 1856, when he succeeded to his title. Under lord Derby he was under-secretary of state for the war department. While his father was governor-general of India, young Hardinge was his secretary, and served as a major in the wars with the Sikhs. On his return he published *Views in India*, a sumptuous work illustrated with his own drawings.

HARDWAR, or HURDWAR, an old t. of India and place of pilgrimage, in Saharanpur district on the right bank of the Ganges at the foot of the Sivalik hills. Pop. '72, 4,800. The town is of great activity, and has borne many names. It was originally known as Kapila. Hwen Tshang, the Chinese Buddhist pilgrim, in the 7th c. A.D., visited a city which he calls Mo-yu-lo, the remains of which still exist at Mayapur, a little to the s. of the modern town. Among the ruins are a fort and three temples, decorated with broken stone sculptures. The great object of attraction at present is the Hari-ke-charen, or bathing *ghat*, with the adjoining temple of Gangadwara. The *churan*, or foot-mark of Vishnu, is imprinted on a stone let into the upper wall of the *ghat*, and forms an object of special reverence. A great assemblage of people takes place annually, and every twelfth year a feast of peculiar sanctity occurs, known as a *kumbh-mela*. The ordinary number of pilgrims at the annual fair amounts to 100,000, and at the kumbh-mela to 300,000. The Hardwar meeting also possesses considerable mercantile importance, being one of the principal horse-fairs in upper India. Commodities of all kinds, Indian and European, find a ready sale, and the trade in grain and food-stuffs forms a lucrative traffic. The Ganges canal draws its supply of water from a branch channel close to the town.

HARDWARE (*ante*), includes an enormous variety of articles manufactured from iron, copper, brass, or bronze, which are variously known as *carpenters'*, *housekeepers'*, or *builders'* hardware. It is almost impossible to classify the articles which come under

the general term, including, as it does, many used by saddlers, miners, contractors, machinists, stationers, carbuilders, and furniture-makers and dealers. Toys, and the limitless varieties of what are called "fancy" articles, all belong to this branch of manufacture, and the yearly traffic in such ware is almost incomputable. A return of £12,000,000 was reported to the British government in 1871 from the principal hardware marts, while in the U. S. census of 1870, the different branches of American industry in hardware produced \$142,836,272.

HARDWICK, CHARLES, 1821-59; b. England; killed by a fall in the Pyrenees. By his own efforts he obtained a good education, and in 1853 was professor of divinity in Queen's college. He was ordained a deacon and priest, and but a short time before his death was appointed arch-deacon of Ely. He published *History of the Middle Age of the Church, Christ, and Other Masters*, etc.

HARDWICKE, PHILIP YORKE, first earl of, 1690-1764; b. England; educated to the law, called to the bar in 1715, and four years afterwards was elected to the house of commons from Lewes, on which occasion the government paid his election expenses. In 1720 he was made a knight, and appointed solicitor-general, rapidly rising to be lord chief-justice of the king's bench, and in 1737 lord chancellor. While George II. was out of the country (1740-48 and 1752) the chancellor was one of the justices selected to administer the government. In 1754 he was made an earl, but two years later he resigned his office, and retired from public life.

HARDY, a co. in n.e. West Virginia, on the s. branch of the Potomac and the Cacapon rivers; 570 sq.m.; pop. '70, 5,518-616 colored. Its surface is mountainous, and to a large extent covered with timber. The valleys are fertile; corn and wheat are the main products. Co. seat, Moonfield.

HARDY, ALEXANDRE, 1560-1631; a French author; in early life writer for a strolling dramatic company, and later the dramatist for the *Théâtre du Marais*. He is said to have been after Lope de Vega and Calderon, the most fertile of dramatic authors, having written over 600 plays. He became a master of stage business and stage effects. To the student of the drama, Hardy will always be an interesting figure, appearing as he does between the degraded morality and the modern comedy, an imitator alike of Italian pastoral and Spanish tragedy. He gave little heed to art; he thought entirely of what would succeed for the moment. His best play is the tragedy of *Mariamne*.

HARDY, GATHORNE, b. 1814; well known in English public life as a conservative politician and leader. He was under-secretary of state for the home department in 1858-59, and entered the British cabinet in 1866 as president of the poor-law board, the earl of Derby being premier. The cabinet resigned, however, two years later, and in 1869 Hardy was returned to parliament from Oxford university. In 1874 the conservatives again came into power, when Hardy was placed in charge of the war department, and in May, 1878, upon the resignation of the marquis of Salisbury, he was made secretary for India, and created viscount Cranbrook.

HARDY, THOMAS, b. 1840; an English writer of fiction. He served his time as an apprentice to an architect, and prosecuted his profession in London, where he became chiefly known as a designer, favoring the modern Gothic style. In 1863 he received a prize from the institute of British architects for an essay on *Colored Brick and Terra-Cotta Architecture*, and also one for architectural design. Recognizing that he possessed skill as a writer, he turned his attention to fiction, and published his first work in 1871, without achieving marked success. In 1872 he brought out *Under the Greenwood Tree*, and in the following year, *A Pair of Blue Eyes*, and by these novels placed himself in the front rank of contemporary novel writers. His later works, *Far from the Madding Crowd* and *The Hand of Ethelberta*, have served to confirm public opinion of the excellence of his work. Mr. Hardy is a most original writer, skilled in the delineation of character, graphic, and sometimes dramatic in depicting situations, and a writer of strong and pure English.

HARDY, Sir THOMAS MASTERMAN, 1769-1839; was made commander in 1797 for distinguished bravery in the battle of St. Vincent. In 1803 he was Nelson's flag-captain, and at the battle of Trafalgar (Oct. 21, 1805) received Nelson's last words, "Don't throw me overboard: kiss me, Hardy." Hardy commanded the South American squadron from 1820 to 1824, and six years later was made a lord of the admiralty. In 1834 he was one of the governors of Greenwich hospital.

HARE, AUGUSTUS JOHN CUTBERT, b. Rome, 1834, of English parents; educated at Harrow and Oxford, and devoted himself to literature. Among his publications are *Epitaphs for Country Churchyards*; *Walks in Rome*; *A Winter at Mentone*; *Memorials of a Quiet Life*; *Walks in London*; and a number of guide books.

HARE, AUGUSTUS WILLIAM, 1793-1834; brother of the archdeacon; b. England; educated at Oxford, and ordained rector in 1829. He wrote with his brother *Guesses at Truth*, and by himself, *Sermons to a Country Congregation*.

HARE, JULIUS CHARLES, 1796-1855; b. Italy; a theological writer. He passed a winter at Weimar, where he met Goethe and Schiller, and received a bias to German literature which influenced his style and sentiments throughout his whole career. On the

death of his mother in 1806, Julius was sent home to the charterhouse in London, where he remained until 1812, when he entered Trinity college, Cambridge. There he became fellow in 1818, and after traveling abroad he began to read law in London in 1819. In 1822 he was appointed assistant-tutor at Trinity college, which position he retained for 10 years. Turning his attention from law to divinity, he was ordained in 1826; and on the death of his uncle in 1832, he succeeded to a rich family living in Sussex, where he accumulated a library of 12,000 volumes, especially rich in German literature. Before taking up his residence in his parish, he once more went abroad, and made, in Rome, the acquaintance of the chevalier Bunsen, who afterwards dedicated to him part of his work, *Hippolytus and his Age*. In 1840 Hare was appointed archdeacon of Lewes, and in the same year preached a course of sermons at Cambridge, *The Victory of Faith*, followed in 1846 by a second, *The Mission of the Comforter*. Neither series when published attained any great popularity. He married in 1834. In 1851 he was collated to a prebend in Chichester; and in 1853 he became one of the queen's chaplains.

HARE, ROBERT, 1781-1853; b. Philadelphia; in early life a brewer, but afterwards gave his attention to science, particularly chemistry. In 1802 he invented the oxy-hydrogen blow-pipe, and was the first to render fusible lime, magnesia, iridium, and platinum. In 1818 he was professor of chemistry in Pennsylvania university, holding the chair 29 years. His collection was presented to the Smithsonian institution. Besides many papers in the scientific journals he published *Brief View of the Policy and Resources of the United States; Chemical Apparatus and Manipulations;* and a *Compendium of the Course of Chemical Instruction*.

HARELIP, a congenital perpendicular fissure or fissures through the upper lip, the result of an arrest of development, (Erichsen). It is named from its resemblance to the lip of a hare, but according to Geoffroy St. Hilaire, it is not analagous to that form of development, but to that which occurs in animals of lower development, viz: fishes. When the arrest of development takes place on one side only, the malformation is called single harelip, and according to Erichsen, it most frequently is located on the left side. When the fissure occurs on each side of the median line the malformation is called double harelip, and the fissure is always deeper on one side than on the other, generally extending into the nostril when it produces cleft palate, the nose being flattened and expanded. Median fissure is extremely rare. Delahaye saw a case of the upper lip, and Nicati one of the lower lip. The cure of harelip requires a very careful operation. There is difference of opinion as to whether the operation ought to be performed before or after dentition, and those who advocate waiting urge that young children are apt to have convulsions from various exciting causes. The weight of authority, however, appears to be in favor of early operations, which are easier to perform before dentition. The child will also be better able to nurse, after the operation. In operating, it is important to procure direct union of the edges of the fissure, which are carefully pared and held together by silver sutures and straps of plaster, and a cheek compressor, an ingenious apparatus by which pressure upon the cheeks tends to keep the cut parts in opposition. The application of water-dressing, or a weak solution of carbolic acid, is often found serviceable, but need not be constantly applied unless, unfortunately, great inflammation occurs, when feeding will have to be done through a tube; but this is rarely the case.

HAREM, the European title for that portion of a polygamist's house which is devoted to the exclusive occupancy of his wives and their attendants, or, by a simple metonymy, for the female portion of his household. The word *harem* is Arabic for anything forbidden or not to be touched. It is generally applied in Moslem law to such things as games of chance, draughts, chess, witchcraft, and portrait-taking, which are inconsistent with the religious code, and under the form of *haram* it is well known, even to Europeans, as designating the sacred inclosure of the principal mosque at Cairo and at Jerusalem (*Haram-eschaberrig*). The word *seraglio*, which is not unfrequently employed as equivalent to harem, is an equivalent modification of the Persian term *serai*, which means a palace or large building, as in the familiar compound *caravanseraï*. Wherever polygamy is maintained in the midst of a developed social life, the harem appears to be an almost inevitable institution. We consequently find it after a more or less rigid type among the Jews, the Babylonians, the Siamese, the ancient Persians, the Peruvians, etc. But it is among the modern Mohammedan peoples that it has attained its most perfect development; and the harems of the sultan of Turkey and the shah of Persia may be taken as the most elaborate and best-known specimens of the type. According to the Koran, the Mussulman is required to satisfy himself with four wives, but the sultan may possess as many as seven. Each of these has her own suite of apartments, her own garden and bath-room, and her own body of servants, male and female. They are not called by their names, but distinguished as *kadin* (or lady) number one, number two, and so on. The title of *sultana* is bestowed only on the mother, the sister, or the daughter of a sultan; and consequently it is the *kadin* who first gives birth to an heir to the empire who alone can have this distinction. She further obtains the title of *hasseky* or *kosseky*, but this is lost if the child dies. All the female slaves, or as they are called *odalisks* (a European corruption of the word *odalik*, from *oda*, a chamber, and *lik*, belonging to), are at the absolute disposal of the sultan, and if, in spite of the natural

endeavors of the kadins to prevent such a contingency, one of them becomes the mother of her lord and master's first-born, she is advanced to the rank of *sultana hasseky*. It is contrary to etiquette for the sultan to select his own favorites among the odalisks; he is expected to accept the choice made for him by his mother, who bears the title of *valide*, and exercises great influence not only in the affairs of the harem but even in political matters. Every odalisk who has been promoted to the royal favor is henceforth considered sacred from all meaner patronage, and receives apartments and attendants of her own; but she has no further claim to the sultan's attention, and may have to console a life-long widowhood with the memory of the honor which was once bestowed on her. The ranks of the odalisks are ever and anon recruited by slaves presented to the sultan by his female relatives or the state officials. An old and devoted favorite of the sultan occupies the post of *kehaya chatun*, or lady superintendent of the harem. A large body of eunuchs, both black and white, are employed as guards and gate-keepers. The white eunuchs have charge of the outer gate of the seraglio, but they are not allowed to approach the women's apartments, and obtain no posts of distinction. Their chief, however, the *kapou aghassi*, or master of the gates, has part control over the ecclesiastical possessions, and even the vizier cannot enter the royal apartments without his permission. The black eunuchs have the right of entering the gardens and chambers of the harem. Their chief, usually called the *kizlaer aghassi*, or master of the maidens, though his true title is *darus scadet aga*, or chief of the abode of felicity, is an official of high importance. His appointment is for life. If he is deprived of his post he receives his freedom; and if he resigns of his own accord he is generally sent to Egypt with a pension of 100 francs a day. His secretary keeps count of the revenue of the mosques built by the sultans. He is generally succeeded by the second eunuch, who bears the title of treasurer or *khaznahdar*, and has charge of the jewels, etc., of the women. The number of eunuchs is always a large one. The sultana *valide* and the sultana *hasseky* have each fifty at their service, and others are assigned to the kadins and the favorite odalisks. [*Encyc. Brit.*, 9th ed.]

HARFORD, a co. in n.e. Maryland, bordering on Pennsylvania, bounded in part by Chesapeake bay and the Susquehanna; crossed by the Philadelphia, Wilmington and Baltimore railroad; 450 sq.m.; pop. '70, 22,605—4,855 colored. The surface is uneven, and the soil fertile; wheat, corn, oats, and pork are the chief products. Co. seat, Bel Air.

HARGRAVES, EDMUND HAMMOND, b. England, 1815. When 18 years old he settled in Australia. In 1849 he went to California, where he was so much impressed with the resemblance of the gold region to certain parts of Australia that he undertook to search for the precious metals in the latter country. He was successful, and was the first discoverer of Australian gold, for which he received rich presents and honors, the legislative council of New South Wales awarding him £10,000. In 1854 he returned to England and published *Australia and its Gold Fields*.

HARINGTON, Sir JOHN, 1561-1612; queen Elizabeth's godson. He studied at Eton and at Christ college, Cambridge, where he took the degree of M.A., his tutor being bishop Still, the famous author of *Gammer Gurton's Needle*. He came to London about 1583 and studied law, but queen Elizabeth seems to have transferred him to a place at court. It is said that it was at her command that he translated Ariosto's *Orlando Furioso*, 1591. In 1596 he published in succession *The Metamorphosis of Ajax*; *An Apology*; and *Ulysses upon Ajax*; the three forming collectively a very absurd and indecorous work of a pantagruelistic kind. In 1599 he served in Ireland under Essex, and was knighted on the field, to the annoyance, it is said, of Elizabeth. In 1608 he wrote a personal satire against the bishops, which he read to James I., but which was first published, by a Presbyterian printer, as late as 1653, under the title of *A Brief View of the State of the Church*. In 1613 his *Epigrams*, which had circulated widely in MS., were printed in a collection of verses of various writers entitled *Alcibiades*, and separately in 1615. They became very popular and were often reprinted. The miscellaneous writings of Harington were collected by the rev. Henry Harington in 1779, in 2 vols., under the title of *Nuga Antiqua*. The *Nuga* includes some very elegant pieces of poetry of the poet's father. The translation of *Orlando Furioso* was a very important labor, and it was carried out with skill and perseverance. Harington, however, was neither a very exact scholar nor a very poetical translator. The *Orlando Furioso* was a sumptuous book, illustrated in the best taste of the day, and to it were appended a prose critique of the poem, and a life of Ariosto compiled from various Italian sources.

HARLAN, a co. in s.e. Kentucky on the Virginia border, drained by Cumberland river; 500 sq.m.; pop. '70, 4,415—99 colored. The surface is hilly with extensive forests. Corn and pork are the main products. Co. seat, Harlan.

HARLAN, a co. in s. Nebraska bordering on Kansas, intersected by Republican river; 576 sq.m.; pop. '76, 2,140. The surface is undulating, and there is very little forest land; soil fertile. Co. seat, Alma.

HARLAN, JAMES, b. Ill. 1820; graduated at Asbury university, and took to the legal profession. He was superintendent of public instruction for the state of Iowa in 1847; in 1853 president of the Iowa Wesleyan university; from 1855 to 1865 U. S.

senator from that state; in 1865-66 secretary of the interior, and again senator from 1867 to 1873.

HARLAY, ACHILLE DE, 1536-1616; b. France, of an old and celebrated family. He was distinguished as a jurist, and succeeded De Thou (whose daughter was his wife) as president of the parliament of Paris. He wrote *La Coutume d'Orleans*.

HARLAY DE SANCY, NICOLAS, 1546-1629; b. France; superintendent of finances and ambassador under Henry III. and IV. D'Aubigné satirized him on account of his frequent change of religious faith; but he is best known as the owner of the large jewel called by his name—the Sancy diamond.

HARLEIAN COLLECTION, certain ancient pamphlets and manuscripts in the British museum, collected by Robert Harley, earl of Oxford, at the beginning of the 18th century. The collection (8,000 MSS. and 400,000 pamphlets) was bought by the government in 1723 for \$50,000. Several volumes of selections from these papers have been published under the title of *Harleian Miscellany*.

HARLEM.—See HAARLEM, *ante*.

HARLEM, or HAARLAEM, now part of the 12th ward of New York city, but originally a separate settlement. Down to about 1760 it was a quaint Dutch village mainly of private residences, surrounded by gardens and farms, and noted for abundance of shade trees, and the sleepy quietness so quaintly described by Washington Irving in his *Knickerbocker's History of New York*.

HARLEM RIVER, a tidal stream from the East river around the upper or n. end of New York island, passing by a narrower channel called Spuyten Duyvil creek into the Hudson or North river, navigable, for a portion of its course, to large vessels.

HARLESS, GOTTLIEB CHRISTOPH ADOLF, D.D.; b. Germany, 1806; graduated at the university of Erlangen in 1829, and a few years afterwards became professor of theology in that institution. In 1842 he was in the Bavarian diet, and vigorously opposed the order requiring all persons in or connected with the army to kneel on the passing of the sacramental host. For this opposition he was removed from the university, but made a counselor of the consistory at Baireuth. Soon afterwards he was professor of theology at Leipsic, pastor and court preacher, and in 1852 was made president of the Protestant consistory at Munich, and a member of the Bavarian council of state. He has published a number of works on religious themes.

HARMAR, JOSIAH, 1753-1813; an officer in the war of independence, serving under Washington 1777-80, and in 1781 under Greene, becoming col. of the first U. S. regiment in 1783. He was the bearer to France of the notice of the ratification of the treaty of peace. Finally, after service as Indian agent, in 1789, he was appointed general-in-chief of the army of the new republic.

HARMONIA, wife of Cadmus, said to have been the daughter of Zeus and Electra, while her brother Iasion was the founder of the mystic rites which were celebrated annually on the island of Samothrace. When Cadmus came there, and was initiated, he received Harmonia as his wife. The gods honored the wedding with their presence; Athene presented the bride with a peplos and necklace; Electra gave the mystic rites of the mother of the gods. According to the scholiast on Euripides, Cadmus, with the aid of Athene carried off Harmonia; and in the mysteries, the lost Harmonia is regularly sought for. We have here an exact parallel to the Eleusinian legends. Electra and Harmonia are mere varieties of Demeter and Core. Cadmus like Pluto carries off the bright daughter of the goddess to the world below to spend there the dreary winter. Hence, in the Theban tale, Cadmus and Harmonia leave Thebes to go away among the Encheleis; the snake people are themselves changed into serpents, and are finally translated to the elysian fields. We then understand, too, why (according to Pausanias, ix. 16, 5) Cadmus dwelt at Thebes in the temple of Demeter Thesmophoros. The necklace, wrought by Hephestus, which Harmonia received as a marriage gift, may be compared with the cestus of Aphrodite; for it is difficult to draw a line between Harmonia or Core and Aphrodite. Then it seems to be mythic representation of some phenomenon like the halo of dawn or the rainbow. Like the works of the German dwarfs, this necklace carried with it ill-luck, and the legends give it a history of woe. With it Polynices bribed Eriphyle to betray her husband Amphiaras. It brought death at last to her son Alcmaeon. Dedicated in the temple of Athene Pronoia at Delphi, it was given by the tyrant Phayllus (352 B.C.) to his mistress; her son going mad, set fire to the house, and she perished in the conflagration.

HARMONIC STOPS designate those stops of a large organ which are composed generally of more than a single rank of pipes, tuned in octaves, double octaves, and double or triple thirds and fifths above the natural pitch of the keys; they comprise the mixture, furniture, cornet, etc. Harmonic stops which have only a single rank of pipes tuned in thirds, fifths, with their octaves above the pitch represented on the key-board, are called "mutation stops." They were introduced to give additional power to the "foundation stops," and also to produce a more brilliant effect in the performance of certain styles of music.

HARMONISTS, a sect founded at Württemberg by George and Frederick Rapp about 1787. The points of belief of the sect, as finally elaborated, are these: Adam was created a dual being, having within his own person both the sexual elements, and the Creator is of the same dual nature; if Adam had been satisfied to remain in his own original race he would have increased without the aid of woman, and brought forth beings like himself, but he became discontented, and then the Creator separated his twofold nature, of the female element making woman to gratify Adam's desire, and therein consisted the fall of man; that the condition of celibacy is the most pleasing to God; that in the renewed world man will be restored to his dual God-like and Adam-like condition; that the coming of Christ and the renovation of the world are near at hand; that we should be in constant readiness for this reappearance; that Jesus was of a dual nature, like Adam before the fall; that Christ taught a community of goods; that ultimately all mankind will find salvation;—but only those who are celibates, and otherwise conform to what they believe to be the commandments of Jesus, will be at once received into the company of Christ and his companions, and that offenders must undergo a probation for purification. They positively reject what is called spiritualism. The early members were so much harassed by petty persecutions, chiefly from the regular churches, that in 1803 they determined to emigrate, and came to Pennsylvania and Maryland. In 1805 they were firmly and prosperously established at Harmony, Butler co., Penn., where they remained ten years. Then they migrated to New Harmony, Ind., remaining there until 1824, when they sold their land to Robert Owen, the socialist, and returned to Pennsylvania, establishing themselves at Economy, Beaver co., 17 m. n.w. of Pittsburg. Here they have grown in wealth and decreased in numbers, for they have of late years sought no accessions. There are probably not more than 100 in the neat little village, and nearly all are old men. The German language is still used. They have much property in real estate, in coal mines, and they control, at Beaver Falls, the largest cutlery manufactory in the country.

HARMS, LUDWIG, 1809–66; b. at Hermansburg, Prussia. He was educated at Göttingen, and became assistant to his father, who was pastor in his native town. He brought the parish speedily into a revived condition, and built a missionary college, not directly soliciting money, but depending upon answers to prayer for all his needs. He gathered a class of students, built a ship, and sent her on a missionary voyage Oct. 18, 1853. In 1854 he established a printing press and a journal of missionary intelligence, which soon attained a circulation of 14,000 copies. He established an annual missionary festival, held in June in the open air, and attended by thousands, including strangers from all parts of Europe. He preached in a church edifice nearly 1000 years old, preserved partly because of its antiquity, but crowded to its utmost limits during two Sunday services, each of nearly four hours. He held also a third Sunday service, in the low German tongue, in his parsonage at night. While continually writing for his missionary journal, he published many books and kept up an enormous correspondence with his missionaries. With many eccentricities of personal conduct, he carried on a work of unparalleled activity with a most devout self-consecration, preaching sitting when at length too weak to stand. His parishioners loved him with a personal affection that was unanimous and without bounds.

HARNETT, a co. in central North Carolina, intersected by Cape Fear, South, and Little rivers, and the Western North Carolina railroad; 550 sq.m.; pop. '70, 8,895—3,038 colored. The surface is hilly, and much is covered with forests. Corn, cotton, and pork are the chief products. Co. seat, Lillington.

HARNETT, CORNELIUS, 1723–1781; b. England; in early life settled in North Carolina. He was a member of the colonial assembly, and one of the prominent leaders in legislation. When the revolution began he was among the most zealous and active friends of independence of the colonies. He was a member of the provincial congress, and on the committee to draft a state constitution, and when in the continental congress he was one of the signers of the articles of confederation. He was a prisoner to the British at the time of his death.

HARO, ALONZO MUÑEZ DE, S.T.D., 1729–1800; b. Spain; studied in the university of Bologna, where he became rector, and professor of sacred literature. In 1770 he was sent out as archbishop of Mexico, where he was famous for his eloquence. He made some valuable presents to St. Peter's church in New York, and it is said that he founded a Roman Catholic free school in that city.

HAROLD, King of Norway. See **HAROLD**, *ante*.

HAROUN AL-RASHID. See **HARÛN**, *ante*.

HARPALUS, one of the youthful associates and cousin of Alexander the great. Phillip banished him 337 B.C. for endeavoring to secure the marriage of Alexander; but the latter recalled him and made him chief of the treasury in the expedition to Asia. He became a defaulter, but was pardoned; was satrap of Babylon, and, on account of his dissipated conduct, was imprisoned at Athens, whence he escaped and fled to Crete, where it is supposed he was murdered.

HARPER, a co. in s. Kansas, bordering on the Indian territory; 1000 sq.m.; pop. about 1500. The surface is level, and there is not much timber. Co. seat, Harper.

HARPER, ROBERT GOODLOE, LL.D., 1765-1825; b. Va. At the age of 15 he was a trooper in Greene's campaign. Soon afterwards he entered the college of New Jersey, and graduated in 1785. He was in the state legislature, and from 1794 to 1801 in congress, where he was among the leaders of the federalists. Harper was for several years eminent among Baltimore lawyers, and made a remarkable defense of judge Samuel Chase, who had been impeached on partisan grounds at the instance of John Randolph. He was elected to the U. S. senate in 1815. A few years later he traveled in Europe. He published a number of essays and addresses, chiefly on political topics.

HARPER & BROTHERS, the name of the largest publishing house in America. From 1825-69 the firm consisted of four brothers; James Harper, 1795-1869, died from injuries received by being thrown from his carriage; was elected mayor of New York city in 1844. John Harper, 1797-1875; Joseph Wesley Harper, 1801-70; Fletcher Harper, 1806-77. The firm now consists of five sons and one grandson of the original members. In 1817 the two elder brothers, after having completed their apprenticeship, commenced business as printers and publishers in New York under the name of J. & J. Harper. The two younger brothers entered their employ, and in 1833 the firm-name was changed to Harper & Brothers. Their establishment became too small for their increasing business, and in 1850 they erected a large and commodious structure on Franklin square, in Pearl street. They had scarcely moved into this when the fire of Dec. 10, 1853, occurred, destroying the entire building, and involving a loss of fully a million dollars. They at once set about erecting a handsome fire-proof structure, on a larger scale, upon the same site. Besides a large catalogue of valuable books, they publish *Harper's Magazine*, *Harper's Weekly*, *Harper's Bazar*, and *Harper's Young People*.

HARPER'S FERRY (*ante*), formerly occupied by the U. S. government, as an arsenal and depot of military stores, was the scene of the attempt of John Brown to start a revolution in the southern states (see BROWN, JOHN), and in the rebellion was among the first places to experience armed collision. In April, 1861, the confederates drove out the handful of union soldiers left to guard the arsenal; but in June the confederates retired, after destroying the bridge, the armory, and the arsenal. In 1863 the confederates again took possession, capturing nearly 12,000 prisoners. After the battle of Antietam the union forces regained the place and held it throughout the war. The pop. is now about 2,500. Harper's Ferry is the seat of Stover college.

HARPOCRATION, VALERIUS, a grammarian of Egypt, respecting whose personal history nothing is known. Some have considered him to be the Greek instructor of the emperor L. Verus, mentioned by Julius Capitolinus, while others have made him live so late as A.D. 360, because several passages are found in his works taken from Athenæus, who is supposed to have flourished about A.D. 300. Harpocraton is the author of a very valuable lexicon on the ten orators, which contains a great deal of information on the law, history, antiquities, and general literature of Athens. The value of this work is much enhanced by the fact that all the authorities from which it has been compiled are lost. Harpocraton is also the author of a work entitled *Collection of Flowery Extracts*.

HARP SEAL, in commercial value the most important of the family of seals, frequenting the coasts of North America on the Atlantic, also Greenland, north Europe, and Asia. Great numbers are caught off Newfoundland. The skin is valuable, and the carcass yields excellent oil. It receives its name from peculiar marks on its back, resembling the shape of a harp.

HARPSWELL, a t. in Cumberland co., Me., consisting of a peninsula and islands in Casco bay, 14 m. e. of Portland, pop. 1749. It is somewhat noted as a resort for pleasure-seekers.

HARRIMAN, WALTER, b. N. H., 1817; a teacher, Universalist minister, and political speaker. In the war of the rebellion he commanded a regiment of volunteers from New Hampshire. In 1867 he was chosen governor of that state, and afterwards was naval officer at Boston.

HARRIOT, or HARIOT, THOMAS, 1560-1621; b. England; an astronomer and mathematician; tutor to sir Walter Raleigh, who, in 1585, appointed him geographer to the second expedition to Virginia. Harriot published an account of this expedition in 1588, and the work was afterwards reprinted in Hakluyt's *Voyages*. On his return to England, after an absence of two years, he resumed his mathematical studies with zeal and success; and having made the acquaintance of Henry Percy, earl of Northumberland, he received from him a yearly pension of £120. A manuscript of Harriot's entitled *Ephemeris Chrysonometria* is preserved in Sion college; and his *Artis Analyticae Praxis ad Aequationes Algebraicas resolvendas* was published at London in 1631. From some papers of Harriot's discovered in 1784, it would appear that he had either procured a telescope from Holland, or divined the construction of that instrument, and that he coincided in point of time with Galileo in discovering the spots on the sun's disk.

HARRIS, a co. in w. Georgia on the Alabama border and Chattahoochee river, crossed by the North and South Georgia railroad; 500 sq.m.; pop '70, 13,284-7,493 colored. It has a hilly surface to a large extent covered with forests. Soil fertile; corn, potatoes, and pork are the chief products. Co. seat, Hamilton.

HARRIS, a co. in s.e. Texas, on Galveston bay, intersected by San Jacinto river and Buffalo bayou, and by four railroads; 1630 sq.m.; pop. '70, 17,375—6,509 colored. The surface is level and much of the soil is alluvial. Products: cotton, corn, and cattle. Co. seat, Houston.

HARRIS, CHAPIN A., 1806-60; b. N. Y.; organizer of the Baltimore dental college, which was the first institution of that character in the world. He published the *American Journal and Library of Dental Science, Dental Art, Principles and Practice of Dental Surgery*, and a *Dental Dictionary*.

HARRIS, HOWELL, 1714-73; b. Wales; an open-air preacher and revivalist, the principal founder of Calvinistic Methodism in Wales. He was endowed with oratorical powers of the highest order, and his energy and enthusiasm carried his audiences by storm. He founded no fewer than 300 societies, was a friend of Wesley and Whitefield, and, when the French invasion of England was anticipated, raised a regiment at his own expense, and accompanied it on its march, preaching and expounding the Scriptures at every halting place.

HARRIS, JOHN, 1802-56; an English theologian who at the age of 15 began to preach as a member of the Bristol itinerant society. After studying at the Independent college at Hoxton, he was in 1827 ordained pastor of a small congregation at Epsom. There in 1836 he wrote his essay *Mammon, or Covetousness, the Sin of the Christian Church*, which won a prize of 100 guineas offered by Dr. Conquest, and brought its author into notice, 30,000 copies being sold within a few years. In 1838 he received the degree of doctor of divinity from Brown university (R. I.), and was appointed president and professor of theology in Chesham college; and in 1850, when the Independent colleges at Highbury, Homerton, and Coward (near London) were united, Dr. Harris was elected principal of the new college thus formed.

HARRIS, SAMUEL, called the "apostle of Virginia," b. Va., 1724. He was a colonel of militia and held several public offices, but about 1758 was baptized and became an active preacher in the Baptist churches, his zeal and the force and plainness of his language bringing upon him persecution and physical abuse. In 1769 he was regularly ordained to the Baptist ministry. He was strongly opposed by the established church of Virginia, but abounded in charity, giving away a large part of his private means. In 1774 the general association of Separate Baptists elected him "apostle," and formally ordained him to that office.

HARRIS, SAMUEL, D.D., LL.D., b. Me. 1814; graduated at Bowdoin and in theology at Andover; teacher at Limerick and East Machias, Me. In 1841 pastor of a Congregational church in Conway, Mass., and in 1851 of the South Congregational church in Pittsfield. In 1855 he was chosen professor of systematic theology in the theological seminary at Bangor, Me., and in 1871 took the same position in Yale. Among his publications are *Zacheus, or the Scripture Plan of Benevolence*; *Christ's Prayer for His Redeemed*; *The Kingdom of Christ on Earth*; etc.

HARRIS, THADDEUS WILLIAM, 1795-1856; b. Mass.; graduated at Harvard, and became a practicing physician. In 1831 he was chosen librarian of Harvard university. He devoted much attention to botany and natural history, and to promote the study of the latter science he organized a natural history society for the students of the college. In 1837 he was one of the state commission to make a botanical and zoological survey of Massachusetts, his most important works being a *Systematic Catalogue of the Insects of Massachusetts*, and his *Report on Insects Injurious to Vegetation*.

HARRIS, THOMAS LAKE, a spiritualist and social reformer, was b. at Fenny Stratford, Eng., May 15, 1823. In 1827 his parents brought him with them to the United States and settled at Utica, N. Y. He was yet very young when his mother died, and his father failed in business, thus throwing him upon his own efforts for education and support. He began to write for the press at an early age. At 21 he renounced the Calvinistic for the Universalist faith, and became a preacher of the latter. His health failing soon after his settlement over a church at Minden, N. Y., he went to Charleston, S. C., whence he returned a year later to New York to become a pastor of the Fourth Universalist church, but ill health compelled him soon to resign. Sometime afterwards he organized in New York an "Independent Christian society," to which he ministered until the advent of "spiritualism" in 1849-50. He soon became a believer and supporter of the new faith. Two or three volumes of poetry from his pen were attributed to spiritual inspiration. He joined a community at Mountain Cove, Va., where it was proposed to apply the principles and laws of spiritualism to social relations and business affairs of the members, but in 1855 he returned to his ministry in New York, and founded a periodical for the exposition of his views. He became a dissenter from some of the doctrines of spiritualism as commonly understood. In 1857 he was, as he believed, subjected to sore temptations from evil spirits, whom he saw and with whom he conversed. He believed he won a victory over these spirits and attained the power, without losing external consciousness, of holding converse with the dwellers in the heavenly spheres. In 1858 he visited England and Scotland, and preached and lectured in London, Manchester, Edinburgh, and Glasgow. In 1861 he retired with a few friends to Amenia, Dutchess co., N. Y., and organized a community which grew into the "brotherhood of

the new life," and in 1867 was removed to Portland, Chautauqua co., N. Y., where Mr. Harris purchased for himself a tract of 1000 acres of land, and adjoining farms of the same extent for his associates. Among those who joined him were lady Oliphant and her son Mr. Laurence Oliphant, M.P., from England. Owners of real estate cultivate it on their own account, community of property not being acknowledged. The "brotherhood" has no written creed or form of government. It is said to number more than 2000 people, mostly in Great Britain and on the continent, in India, and Japan, and to be held together by fraternal love and guided by an inspiration "from the Divine Spirit through the heavens," in fulfillment of a promise made "by the angel" to Swedenborg. They hold that man can be purified from sin and delivered from the power of evil spirits only through self-renunciation and a life of unselfish devotion to humanity, and that the church of the future will not be an ecclesiasticism, but a free society of people bound to each other by ties of fraternity and a common love of the Divine Being. They believe that God is two-in-one by the blending in him of the maternal with the paternal character, and that those who become angels will find their counterparts of sex and be joined together for all eternity. Marriage, therefore, is by them held to be peculiarly sacred and divine. Mr. Harris's prose works are: *Wisdom of Angels; Arcana of Christianity; Truth and Life in Jesus; Modern Spiritualism—its Truth and Errors; Sermons and Lectures; Millennial Age; and Breath of God with Man*. His poetical works are: *Starry Heavens; Lyric of the Morning Land; Lyric of the Golden Age; Regina; Hymns of Spiritual Devotion; and The Great Republic*.

HARRIS, TOWNSEND, 1803-78, an American diplomatist, b. at Sandy Hill, Washington co., N. Y. At the age of 14 he came to New York city and engaged in mercantile life, but was actively identified with the cause of popular education. While president of the board of education, an office twice held by him, he succeeded in spite of long and pitiless opposition, in getting the free academy (now college of the city of New York) established. In 1848 he projected and carried out a voyage of exploration and commerce in the South Pacific, gaining vast information which he turned to the benefit of the country. He was U. S. consul at Ningpo, China, 1854. In 1855 he was considered by the patriotic men of all parties the best equipped man to follow up the work of com. M. C. Perry in Japan. On his voyage outward he negotiated a treaty with Siam, and from 1856 to 1861 was consul-general of the United States in Japan, residing at Shimoda; and in Yeddo where he negotiated a treaty of trade and residence for Americans in Japan. Perry opened Japan to ships and their crews only. Harris inaugurated the policy of friendship, commerce, and residence, which twenty nations now enjoy with Japan. He was one of the founders of the New York "society for the prevention of cruelty to animals." A biography of Harris is in preparation.

HARRIS, WILLIAM, S.T.D., 1765-1829; b. Mass.; graduated at Harvard and licensed as a congregational preacher, but became minister of an Episcopal church in Marblehead; subsequently rector of St. Mark's church, New York, and the founder of a school for classical studies. In 1811 he was elected president of Columbia college and held the office 18 years.

HARRIS, WILLIAM TORREY, LL.D., b. Conn. 1835; studied at Yale college; emigrated to the west and became a teacher in St. Louis, and soon afterwards superintendent of public schools. He was one of the founders of the St. Louis philosophical society, and in 1867 he started the *Journal of Speculative Philosophy*. In 1874 he was president of the national association of teachers. He is one of the recognized leaders in metaphysical investigation on this side the Atlantic. He is an earnest advocate and expounder of Hegel's philosophic system.

HARRISBURG (*auth*), the capital of Pennsylvania, in Dauphin co. on the Susquehanna river, and the Cumberland Valley, the Northern Central, the Pennsylvania, and the Philadelphia and Reading railroads; 106 m. by rail w. of Philadelphia; pop. '70, 23,104; in '80, 30,412. The Susquehanna is here over a mile wide, and there is a small island near the middle of the stream. There are three railroad bridges crossing the river. The city is handsomely situated in the midst of a picturesque and fruitful region. One of the most conspicuous edifices is the state-house, a fine brick structure 180 by 80 ft., with a circular Ionic portico over which is a dome, from which a splendid view is to be had. The capitol was first occupied in 1822. Among the other public buildings are the court-house, the state lunatic asylum, the prison, several market-houses, and some fine churches and school-houses. Harris park is a handsome public square. Among the chief manufacturing establishments iron foundries hold a leading place; there are also machine-shops, nail factories, car, coach, and steam-engine factories; cotton, knitting, planing, and saw mills, tanneries, breweries, etc. There is a regular city government consisting of a mayor and common council. The city is finely paved, and is supplied with gas and water. There are about 35 churches embracing more than a dozen denominations. The city is the seat of a Roman Catholic archbishop. The earliest settlement was in 1726 by John Harris, an Englishman, who engaged in trade with the Indians. In 1785 a town was laid out for the seat of justice of the county of Dauphin (named after the French dauphin). The town was named Louisburg, after Louis XVI., but six years later it was incorporated under its present name; in 1812 it was selected as the state capital, and in 1860 incorporated as a city.

HARRISON, a co. in s. Indiana on the Ohio river, intersected by Indiana creek, and the Missouri, Iowa and Nebraska railroad; 500 sq.m.; pop. '70, 19,913. It has a hilly and picturesque surface. Chief productions: corn, wheat, oats, and pork. Co. seat, Corydon.

HARRISON, a co. in w. Iowa on the Nebraska border, intersected by the Chicago and Northwestern, and the Sioux City and Pacific railroads; bounded on the w. by the Missouri; 700 sq.m.; pop. '80, 16,649. The surface is mostly level, and the soil fertile, producing corn, wheat, oats, etc. Co. seat, Logan.

HARRISON, a co. in n.e. Kentucky, intersected by Licking river, and the Kentucky Central railroad; 370 sq.m.; pop. '70, 12,993—2,378 colored. It has a hilly and undulating surface, and fertile soil. The main productions are corn, wheat, oats, and pork. Co. seat, Cynthiana.

HARRISON, a co. in s. Mississippi on the gulf of Mexico, drained by Wolf and Biloxi rivers, and reached by the Mobile, New Orleans and Texas railroad; 900 sq.m.; pop. '70, 5,795—1427 colored. It has a prairie surface, with considerable timber. Co. seat, Mississippi City.

HARRISON, a co. in n. Missouri on the Iowa border, intersected by Crooked Fork of Grand river; 760 sq.m.; pop. '70, 20,318—73 colored. Surface prairie and timberland; main productions: corn, oats, wheat, pork, and cattle. Co. seat, Bethany.

HARRISON, a co. in e. Ohio drained by affluents of Tuscarawas river, and intersected by the Pittsburg, Cincinnati and St. Louis railroad; 400 sq.m.; pop. '70, 18,682. The surface is somewhat hilly, and the soil very fertile. Chief productions: corn, oats, wheat, butter, and wool. There are mines of bituminous coal. Co. seat, Cadiz.

HARRISON, a co. in s.e. Texas on the Louisiana border between Caddo lake and Sabine river, intersected by the Texas and Pacific railroad; 970 sq.m.; pop. '70, 13,241—8,931 colored. Surface uneven and much of it covered with forests. The soil is fertile, producing cotton, corn, etc. Co. seat, Marshall.

HARRISON, a co. in n. West Virginia on the w. fork of Monongahela river, traversed by the Baltimore and Ohio railroad; 445 sq.m.; pop. '70, 16,714—655 colored. The surface is hilly or mountainous with fertile valleys. Productions: corn, wheat, lumber, and pork. Co. seat, Clarksburg.

HARRISON, BENJAMIN, 1740—91; b. Va. He studied at William and Mary college, and in 1764, and 1777—82 was speaker of the colonial house of burgesses. He was an opponent of the stamp act, a delegate to the first continental congress, and one of the signers of the declaration of independence. In 1782 he was chosen governor of his state, and was twice re-elected. He was a member of the committee that adopted the federal constitution, but himself voted against it. He was the father of William Henry Harrison, ninth president of the United States.

HARRISON, JOHN, d. 1660; a col. in Cromwell's army, on whom devolved the duty of escorting Charles I. from Hurst castle to Windsor, in Dec., 1648, and from Windsor to London for trial. He was afterwards made a maj.gen., and became important in the councils of the protectorate. In religion he was a fanatic, and in 1653 was leader of the Anabaptists. On the restoration of Charles II. in 1660, Harrison was executed, in company with nine other regicides.

HARRISONBURG, the seat of justice in Rockingham co., Va., on a branch of the Baltimore and Ohio railroad, in the Shenandoah valley, 2 m. n.e. of Staunton; pop. 3,600. In the place are eight churches, several schools, and a number of manufactories.

HARRODSBURG, the seat of justice of Mercer co., Ky., on a branch of the Cincinnati Southern railroad, and near Salt river, 32 m. s. of Frankfort; pop. '70, 2,205. It has mineral springs, and is a place of summer resort. Among its institutions is Daughters' college, under the care of the Christian denomination. There are flour mills, carriage factories, and distilleries. It is said to be the oldest town in the state, the settlement dating from 1774, when capt. James Harrod put up the first cabin in that neighborhood.

HART, a co. in n.e. Georgia on the border of South Carolina, bounded n. and e. by Savannah river; 380 sq.m.; pop. '80, 9,094—2,804 colored. The surface is uneven, and much of it is covered with forests. Corn and cotton are the chief productions. Co. seat, Hartwell.

HART, a co. in w. central Kentucky on Green river, intersected by the Louisville and Great Southern railroad; 420 sq.m.; pop. '70, 13,687—2,192 colored. The surface is hilly, and to a large extent covered with forests. The main products are cotton and corn. Co. seat, Hartwell.

HART, JAMES McDUGAL, b. Scotland 1823; came, when a child, to the United States, and became a coach-painter in Troy, N. Y. A love of art led him to attempt landscapes, and in 1851 he studied in Düsseldorf under Schermer. In 1856 he settled in New York, and the next year became an associate in the academy of design, and two years later an academician. "Autumn Woods," "Moonrise in the Adirondacks," "Coming out of the Shade," and "On the March" are his noted works. Mr. Hart, with his

brother William, was among the first of that group of American artists who have made American landscape art eminent. He paints with vigor, and close adherence to nature; his work is full of sentiment, and is further marked by great breadth of handling in composition.

HART, JOEL T., b. Ky., 1810. When about 20 years of age he began to work for a stone-cutter, and at once exhibited a talent for modeling in clay, which attracted public attention, and he was employed to model busts of gen. Jackson and Cassius M. Clay. Of the latter he made a bust in marble, and this was so satisfactory that an association of ladies engaged him to produce the statue of Henry Clay, which is in Capitol square, Richmond, Va. There is a specimen of his work in bronze in New Orleans, in the shape of a colossal statue of the same statesman. Hart has resided many years in Florence, where he has made numerous statues, busts, etc. Among them "Angelina," "Il Penseroso," and "Woman Triumphant."

HART, JOHN, 1708-80; b. N. J.; a farmer, and several times a representative in the provincial legislature, and in 1776 was sent to the continental congress. He was, in 1777-78, a leading member of the committee of safety. During the English invasion his farm was desolated and he was hunted as a fugitive. After the battle of Trenton he returned to his home. He was one of the signers of the declaration of independence.

HART, JOHN SEELEY, LL.D., b. Mass., 1810; graduated at Princeton, taught at Natchez, Miss.; and in 1834 returned to the college of New Jersey as adjunct professor of ancient languages, where (1836-41) he was in charge of the Edgehill school. He was principal of the Philadelphia high school (1842-59), and of the New Jersey state normal school (1863-71); in 1872 became professor of rhetoric and the English language in the college of New Jersey. Among his publications are *Prose Writers of America*; *Manual of English Literature*; *Manual of American Literature*, etc.

HART, NANCY, a colored woman of Georgia, famous in the revolution for acts of valor in support of the cause of American freedom. Her chief exploit was in the case of five Tories who came to her cabin intent on plunder and outrage. She killed one, seriously wounded another, and took the other three prisoners. Hart county bears her name, given in honor of her patriotic conduct.

HART, WILLIAM, brother of JAMES McDUGAL HART; b. Scotland, 1823; came to Albany, N. Y., in 1831, and, like his brother, was employed in coach painting in Troy. Like his brother, also, he developed a taste for landscape painting, and in 1848 exhibited a specimen of his work in the National academy of design in New York. In 1850 he returned to his native country for study. On returning he settled in New York, and soon became an academician. For several years he was president of the Brooklyn academy of design. Some of his most notable works are "The Last Gleam," "The Golden Hour," "Opening in the Elands," "Up the Glen in the White Mountains," and "Sunset in Dark Harbor, New Brunswick." He was one of the founders, and for some years president of the water-color society, and is himself eminent in that branch of art. He is remarkable for luminous brilliancy of coloring, particularly in skies.

HARTE, FRANCIS BRET, b. N. Y., 1839; went to California when 15 years old and roved about, digging for gold, teaching school, and running express. In 1857 he appeared in the *Golden Era* as a type-setter, but soon began to write sketches for the paper which attracted immediate attention. He was advanced to assistant editor, and a little later became principal editor of the weekly *Californian*. He was for six years secretary of the mint in San Francisco, and during the time wrote a number of poems for the city journals, such as "The Society upon the Stanislaus," "The Pliocene Skull," and "John Burns of Gettysburg." In 1868 he was an editor of the *Overland Monthly*, in which he began more ambitious work with "The Luck of Roaring Camp," a characteristic picture of mining life. The next year he published "The Outcasts of Poker Flat," following with other tales of a similar kind. In 1870 appeared a short poem entitled "Plain Language from Truthful James," or "The Heathen Chinee," which had unexampled popularity. For a short time he was professor of recent literature in the university of California. In 1871 he removed to New York and collected and published his *Condensed Novels*. Among other of his publications are *Gabriel Conroy*, *East and West Poems*, *Mrs. Skagger's Husbands*, etc. He has been a frequent contributor to the *Atlantic Monthly*. In 1878 he was appointed U. S. consul to Crefeld, in Rhenish Prussia, and afterwards exchanged to Glasgow, Scotland.

HARTFORD, a co. in n. Connecticut, on the Massachusetts border, intersected by Connecticut, Farmington, Scantic, and Hockanum rivers, and by six railroads; 770 sq. m.; pop. '70, 109,007; in '80, 125,377. It has a hilly surface, and the soil is generally very fertile; chief productions: tobacco, corn, oats, butter, and fruit. There are also a large number of important manufacturing establishments. Co. seat, Hartford city.

HARTFORD (*ante*) is on the New York, New Haven and Hartford railroad; pop. '80, 42,553. This "queen city of New England" is beautifully situated on small hills at the junction of the Park river with the Connecticut. The township extends about $5\frac{1}{2}$ m. n. and s., and $3\frac{1}{2}$ e. and w., having an area of more than 16 sq. m.; the city area is about 10 sq. miles. Park river runs through about the middle, and is crossed by a dozen bridges. There is a fine bridge over the Connecticut, about 330 yards long, con-

necting with East Hartford. The city is regularly laid out, Main street being the great thoroughfare and chief seat of retail trade. In the outer portion and the suburbs of the city are many fine residences. The principal pleasure-ground is the Bushnell park, named after the late rev. Dr. Horace Bushnell, whose memory Hartford treasures as one of its peculiar honors. The park is one of the finest of its size in the country. It covers 45 acres, and is nearly encircled by Park river. In the w. part are the state capitol, a colossal bronze statue of Thomas Church Brownell, Episcopal bishop of Connecticut and the founder of Trinity college (Hartford); Ward's statue of gen. Israel Putnam, and a statue of Dr. Horace Wells, in honor of his discovery of the use of anæsthetics. In the heart of the city is Statehouse square, containing the original statehouse, a brick structure built in 1794. The famous Hartford convention met in the senate chambers in 1815. In the secretary's office is the original charter of the colony framed in wood, of the charter oak. There are in the senate chamber Stuart's portrait of Washington, and portraits of all the governors of the colony and state from 1667 down. The new state capitol occupies the former site of Trinity college. The building, completed in 1878 at a cost of \$1,500,000, is of white marble, 300 by 200 ft., and 250 ft. to the top of the dome. Its fronts are broken by angles, columns, arches, galleries, and commemorative sculpture. Resting on the brow of a hill, it commands a splendid view, and is itself seen from all parts of the city. The hall of representatives is in the center of the s. front, and is lighted on three sides. The arcades are upheld by polished granite columns, and the tympani are filled with sculptures, the subjects of which were selected from Connecticut history. At the angles of the dome are statues representing 12 of the original states, and on the top is a statue of Connecticut holding her charter. The new site of Trinity college is on Rocky hill, approached by avenues leading through the most delightful part of the city. The buildings (yet unfinished) are of brownstone in early French Gothic style. They will form three great quadrangles, and are intended to be the best edifices for educational purposes in the country. The front will be 1300 ft. long. The grounds cover 80 acres. The high school is a noble building, of Norman architecture, costing \$160,000. Near by, on Asylum street, is the residence of the late Lydia H. Sigourney, the poetess. A mile away on a hill lives Samuel L. Clemens, more generally known as "Mark Twain." Another conspicuous feature is Armsmead, the residence of the Colt family, the spacious grounds being adorned with groves, lakes, statuary, greenhouses, and a deer park. The deaf and dumb institute, founded by Dr. Gallaudet in 1817, is the oldest of its kind in America. The building is finely situated on a shady hill, and usually has from 200 to 250 inmates. The retreat for the insane is a stately sandstone building commanding a splendid view. More than 4,000 patients have been received here, and 2,000 have been cured. The city hospital, the state arsenal, and the widows' home are also noteworthy edifices. Besides these there are many conspicuous business edifices of great extent and value. The great manufactories are the Colt rifle and pistol factory (capital \$1,000,000), the Washburn car-wheel factory, the Weed sewing machine factory, the Pratt and Whitney machine company, the Phoenix iron foundry, the Plimpton envelope company, the Batterson marble works, and the Cheney silk works. Among the great book makers are the American publishing company, and Case, Lockwood and Brainard. There are 37 churches, many of them very beautiful structures, particularly that of the Good Shepherd (Episcopal) built by Mrs. Colt as a memorial to her husband, of Gothic style with grand pictorial windows. In the old graveyard behind the Center Congregational church lie the remains of Thomas Hooker, "the renowned minister of Hartford, and pillar of Connecticut, the light of the western churches," with the ashes of a long line of distinguished citizens from the earliest settlement. The chief monument is a massive sandstone structure to the honor of the first settlers. There are 17 banks, 9 masonic lodges, 3 of odd-fellows, 3 of knights of Pythias, 21 temperance societies, and 7 military companies. Of the latter, the Putnam phalanx of only 125 men are said to represent \$11,000,000 of property. In proportion to the number of inhabitants, Hartford is supposed to be the richest city in America. The Cedar hill cemetery, on a bare and lofty elevation, has some fine monuments, including the Beach memorial, and testimonials to Colt, Russell, and others. Another institution worthy of note is the Wadsworth atheneum in which are many works of art by painters and sculptors. The Connecticut historical society has quarters in the atheneum, and has a remarkable collection of ancient documents illustrating New England history.

The city is divided into seven wards; the mayor is chosen for two years; the aldermen (two for each ward) are chosen one-half annually, and hold office two years; and the council of four for each ward are elected annually. There are police and fire departments, good water supply, and gas. Among the institutions not mentioned are the Hartford hospital, the orphan asylum, city mission, home mission, state Bible society, state missionary society, a number of private benevolent societies, a female seminary, and several select schools. There are 16 public schools, a grammar school (the oldest in the state), dating from 1655, and a school of design. Hartford has an interesting history. It was settled in 1635 by persons from Massachusetts, but originally from Braintree, England. The Dutch of New Amsterdam had possession for a time, but were ejected in 1654. The general court of the colony was established in 1636; the first church built in 1638; a war with the Pequot Indians occurred in 1637, and in

1639 a constitution for the government of the colony was framed. A house of correction was built in 1640, and four years later the first tavern was authorized. In 1650 a code of laws was drawn up which reduced the number of capital offenses from 160 under English law to 15. In 1687 gov. Andros attempted to seize the colonial charter, but it was carried off and hid in the famous charter oak. A printing establishment was started in 1764. Connecticut was early in the patriotic movement of the revolution, and Hartford was well represented at the taking of Ticonderoga. In 1784 the city was incorporated, and in 1875 it became the sole seat of the state government, an honor theretofore shared with New Haven.

HARTFORD CONVENTION (*ante*). To the brief statement under this head may be added from the journal of the assembly (not published until 1833) some further facts, premising, however, that much of the odium thrown upon the convention was undeserved, and mainly the offspring of partisan malignity. The controlling idea of the body was the preservation of those state rights for which their opponents, the democrats, were then and have ever since been loudly clamoring. The men composing the convention were among the best and most intelligent citizens, but all were federalists. The war with England had destroyed the prosperity of the eastern states, yet they made no opposition to the war, as was untruly charged. In fact the war was over, for the peace of Ghent was agreed upon before the convention got fairly to work, though the fact was unknown, and the battle of New Orleans was fought nearly two weeks after the treaty was signed. The federalists, at whose head once stood George Washington, had greatly declined, and had no real strength in the nation. The complaints of the convention were: That the New England states were deprived of their militia while their sea-coast was left at the mercy of the English enemy; that some check ought to be put upon the almost arbitrary powers of the general government; but the acts of the three states calling the convention were to be "not repugnant to their obligations as members of the union." So said Massachusetts, and Connecticut and Rhode Island agreed. There is no ground for the charge that the convention was or intended to be disloyal. The main propositions are stated (see *Hartford Convention, ante*), and amount to this: That the people of a state ought not to be subject to draft or conscription "not authorized by the federal constitution." That the general government ought to empower the states to defend their own territory against foreign enemy. That the legislatures of the three states should authorize their governors to make detachments of militia or farm corps which should be ready for service in the state, or, on the application of a governor, to assist in defense in other states. The convention's views on amending the federal constitution savored of that nativism that afterwards developed into a great but short-lived American party. They held that no person not then naturalized should afterwards be eligible for a member of congress, or hold any civil office under the authority of the United States. Their one term for president had long been popular with nearly half of the voters in the union, though they went a step further and wished to provide that a state should not furnish two presidents in succession. They would require a vote of two-thirds of each house of congress for the admission of a new state, and would have representatives and direct taxes apportioned (as they now are) on the basis of the number of free persons in a state. This was of course aimed at the southern states, where the slaves were counted in a two-thirds ratio as representative people. The convention, with a view to the great commercial interest of the eastern states, desired that a vote of two-thirds in congress should be necessary to declare war or interdict commerce, except in case of an actual invasion. The convention met Dec. 15, 1814, and adjourned Jan. 5, 1815. There were 12 delegates from Massachusetts, 7 from Connecticut, 3 from Rhode Island, 2 from part of New Hampshire, and 1 from a county in Vermont—in all 25 persons.

HARTLEY, Sir CHARLES AUGUSTUS, b. England 1825; an engineer and railroad builder. He served through the Crimean war, as capt. of engineers in the Turkish contingent, in 1857 was made engineer-in-chief to the European commission of the Danube, and in 1862 was knighted by the queen. He has been concerned in a great number of enterprises in the line of his profession in the employ of the English, Russian, Turkish, and other governments.

HARTMANN, EDUARD VON, a philosopher, b. in Berlin, 1840. Educated at the gymnasium and the school of artillery, he was commissioned as an officer in 1861; but the following year an accidental injury of his foot produced a disease which has proved to be incurable and has confined him to his room and, in a great degree, to his bed, where his time and thoughts have been devoted to philosophical inquiries. The principal work thus produced is *The philosophy of the unconscious*, in which taking his stand at the meeting point of the unconscious and the conscious, of natural science and philosophy, of the brain and the mind, he endeavors to trace and state the nexus between them. The unconscious in nature has, he says, both a will, which is not merely (according to Schopenhauer's theory) "irrational" but is able to determine itself to prototypal ideas; and also an idea which is not merely (according to Hegel's theory) "logical" but is capable of attaining reality by will. In the mind this unconscious will and idea are to be found in the "first principles," and are at work in the instincts, love, emotions, morals, æsthetics, and language. This book has awakened considerable interest in Ger-

many and made its author eminent among the thinkers of the age. It is not yet evident, however, that he has solved the problem of the unconscious in nature, or of the nexus between the conscious and unconscious in man's complex being, though he has freshened the problem by setting it forth in novel terms.

HARTMANN, MORITZ, 1821-72; a German poet, b. Bohemia, of Jewish parents. He studied at Prague and Vienna, and, after a tour in Italy, Switzerland and south Germany, became a teacher in Vienna. He left Austria, to publish without danger a volume of poems entitled *Kelch und Schwert*, in which he gave expression to radical sentiments as regards both church and state. After residing for some years in Belgium and France, he came to Leipzig, where in 1847 he published *Neuere Gedichte*. Returning to Austria he suffered a short imprisonment, from which he was freed by the revolution of March, 1848. In the same year he was chosen to represent the district of Leitmeritz in the Frankfort parliament, where he took his seat on the extreme left. In Oct. he accompanied Blum and Fröbel to Vienna, but he made his escape before the execution of Blum, and took part in the deliberations of the "Rump Parliament" at Stuttgart. In 1849 he published the *Reimchronik des Pfaffen Maurizius*, a satirical political poem in the style of the old chronicles. After the dissolution of the rump parliament he went to Switzerland, then to England and Ireland, and in 1850 to Paris, where, beside other literary engagements, he held that of correspondent to the *Kölnische Zeitung*. On the outbreak of the Russian war, he became correspondent of the same paper in the Crimea, where he remained 18 months. After several years' residence at Paris he settled in 1860 at Ghent, where he delivered courses of lectures on German literature and history in some of the principal academies. In 1863 he removed to Stuttgart to edit the *Freya*, and in 1868 he undertook editorship at Vienna of the *Neue Freie Presse*. Hartmann published several volumes of poems in addition to those mentioned, and besides his spirited accounts of his travels and adventures he is the author of various novels of more than average merit.

HARTMANFT, JOHN FREDERIC, b. Penn. 1830; graduated at Union college, and was admitted to the bar in 1859. He was an early volunteer on the union side in the war of the rebellion, and was aide-de-camp to gen. Franklin in the first battle of Bull Run. In July, 1861, he was in the Burnside expedition and led the 51st Pennsylvania regiment in the attack on Roanoke island, and in the battle near Newbern, in March, 1862. At Antietam he led his regiment in a brilliant and successful charge. After fighting gallantly at Fredericksburg he was ordered to Kentucky. In June, 1863, he was in command of a brigade at Vicksburg, and afterwards was with Sherman in the advance to Jackson, Miss. He was in other actions, particularly the battle of the Wilderness, and in May, 1864, became brig. gen. On March 25, 1865, he recaptured fort Steadman, before Richmond, displaying great bravery, for which he was brevetted maj. gen. After the war he was twice chosen auditor-general of Pennsylvania, and in 1872 was elected governor.

HARTSHORNE, JOSEPH, 1779-1850; b. Va.; studied medicine in Pennsylvania university, and graduated in 1805. After traveling in the East Indies he settled in Philadelphia, and became one of the surgeons of the state hospital. He was a member of the society of Friends, and his first ancestor in America was an associate with William Penn in the government of east Jersey. Two of his sons (Edward and Henry) are eminent as physicians and surgeons, and both have written largely on medical themes.

HART'S, or SPECTACLE, ISLAND, in Long Island sound, about 25 m. e. of New York. It is owned by the city, and on it are the industrial school, the city cemetery, a branch of the lunatic asylum, and a branch of the almshouse. The public burying-ground, or potter's field, receives annually nearly 2000 unidentified bodies. It contains only one monument, and that is to unknown soldiers. The industrial school, under the care of the commissioner of charities and correction, has usually 300 pupils.

HARTSUFF, GEORGE L., 1830-74; b. N. Y.; graduated at West Point; served on the frontier and in Florida, and was seriously wounded in a fight with the Seminoles. In the war of the rebellion he served with bravery until severely wounded at Antietam, being chief of staff to gen. Rosecranz, and brig. gen. In March, 1865, he was again in the field and took command of Petersburg after its capture. In 1871 he was retired with the rank of maj. gen.

HARTSVILLE, a village of Bartholomew co., Ind., 48 m. s.e. of Indianapolis. It is the seat of Hartsville college, organized in 1851 under charge of the Moravians, or United brethren.

HARTWICK, a village in Otsego co., N. Y., 68 m. w. of Albany on the Coopers-town and Susquehanna Valley railroad; pop. of town '75, 2,180. Near by is the Hartwick theological seminary, under Lutheran management. It has water power and a few manufactories.

HARTWIG, JOHN CHRISTOPHER, 1716-96; a German Lutheran preacher, chaplain in the English army, and on duty in America. He was in the first Lutheran synod held in the country in 1748; preached in several cities and towns, and was the founder of Hartwick theological seminary, Hartwick, N. Y. It is said that he predicted at the age of 40 that his death would occur (as it did) on his 80th birthday.

HARUGARI, an order in the United States, composed chiefly of Germans started in 1847, and supposed to number over 20,000 members. Its aims are social and benevolent, and particularly the preservation of the German language. There are a general or national lodge, state lodges, and about 240 subordinate lodges.

HARVARD, JOHN, 1608-38; b. England, and educated at Cambridge university. In 1637 he emigrated to Massachusetts where he was made a freeman, and performed the duties of a minister. By his will one-half of his estate was given towards founding a college, and his books were given to the prospective library. The bequest was about \$4,000, and in 1638 Harvard college was opened under the name of its chief donor.

HARVARD COLLEGE (*ante*), or more properly **HARVARD UNIVERSITY**, by which title the institution has been known for many years past, comprehends the following departments: The college proper, the Lawrence scientific school, the divinity school, the law school, the medical school, the dental school, the botanic garden and herbarium, the Bussey institution of agriculture and horticulture, the Peabody museum of American archaeology and ethnology, the museum of comparative zoology, the astronomical observatory, and the library. Of these the college proper, or the academical department, is of course the oldest, dating from the original foundation of the institution in 1636; the medical department, established in 1782, is the next in age; then follows the divinity school, established in 1817, at the time of the Unitarian controversy in Massachusetts. The other departments are of more recent establishment, the law school having been founded in 1817, but opened in its present building in 1832; the Lawrence scientific school in 1848, and the dental school in 1868. The museum of comparative zoology and the Peabody museum of American archaeology and ethnology, though connected with the university, are affected in their relation to it by peculiar provisions, being responsible in some degree to separate governing boards. The astronomical observatory and the library have been regarded as separate departments of the university system only during the past few years. The government of the university is vested in two bodies, the corporation and the board of overseers. The corporation is made up of the president, the treasurer, and five fellows, the president and treasurer being chosen by the fellows, who are a self-perpetuating body. The corporation initiates all measures concerning the college, is responsible for the care of its funds, and elects the officers of instruction and government in the various departments, subject to the ratification and final action of the board of overseers. The board of overseers, originally consisting of the congregational ministers in Cambridge and the adjoining towns, was subsequently elected by the state legislature, but since 1866 has consisted of 30 of the alumni of the university, five of whom are elected annually for the term of six years. The president of the university is president of the faculties of the several departments, each of which has a distinct dean. All the departments enumerated above are located in Cambridge, with the exception of the medical and dental schools, and the Bussey institution, which are in Boston. The buildings are for the most part situated on a level plain in Old Cambridge, 3 m. w. of Boston. Those used as dormitories for the students are Hollis hall, Stoughton hall, Holworthy hall, Thayer hall, Weld hall, Matthews hall, Gray's hall, Holyoke house, and college house, Boylston hall, Harvard hall, university hall, Massachusetts hall, Holden chapel, and Seaver hall, are employed either for recitation rooms or for laboratory or other miscellaneous use. The Lawrence scientific school, the law school, the divinity school, the Peabody museum, the museum of comparative zoology, the observatory, and the botanic garden, have one building each for their respective uses. The Hemenway gymnasium was completed in 1880. The largest and costliest of the university buildings is Memorial hall, erected 1870-76 as a memorial of the students of the university who fell in the union army during the rebellion. This building consists of three parts: the memorial vestibule, containing tablets giving the names of the dead, the large dining hall, surrounded with portraits and busts of the benefactors of the university; and Sanders theater, in the semi-circular auditorium of which the commencement and other leading public exercises of the university are held. Memorial hall cost about \$500,000, and is the largest single college edifice in the world, the dining hall alone, it is claimed, being one-third larger than the largest of the English university halls. The other buildings of the university are the medical and dental schools, in Boston proper, and the building of the Bussey institution, near Jamaica plain, within the Boston city limits. The oldest building is Massachusetts hall, built in 1720; the most recent is Seaver hall, built in 1880. The general arrangement of the buildings in the college yard in Cambridge is in the form of quadrangles, of which the western one is now completed, while the eastern is being gradually filled up. The university owns a brick house for the president. The library is housed in Gore hall, which aims to be a copy of king's college chapel, in Cambridge, England, and which has recently been considerably enlarged. Wadsworth house is the name which has of late years been given to the old president's house, within the college yard, occupied by the presidents of the university from 1726 to 1849, but now rented by the college as a dormitory for professors and students. Appleton chapel occupied for daily morning prayers during the academic year, and for Sunday services for those students not having other church connections, was built in 1858.

The course of study in the college proper is of four years, and leads to the degree of

bachelor of arts, but the elective system of studies has been employed at Harvard to a far greater extent than in any other American college, the required studies being virtually limited to the freshman year. Even in mathematics the lecture system largely takes the place of the old method of instruction by text books. The course in the law school, leading to the degree of bachelor of laws, has recently been extended to three years; and in the medical school three full years of study are now required of candidates for the degree of doctor of medicine. The course in the scientific school is four years, in the dental school two years, and in the divinity school three years; while in the other departments the length of study is not rigidly prescribed. The university at present confers no degrees on students without examination, one year of study being a pre-requisite to the degree of master of arts, two years to that of doctor of philosophy, and two years to that of doctor of science. The number of candidates for these three degrees—established during the past decade—is usually about sixty. The examinations, however, are so rigid that the number of degrees annually conferred is much smaller than this figure. The whole number of officers of instruction and government is about 150. The number of students in all the departments of the university has for the past few years exceeded 1300, of which about 800 have been in the college proper. Of these, considerably more than half are from the state of Massachusetts. The whole number of alumni of the college proper (to 1879) is 9,175; the number of graduates of all departments (to 1875) is 12,812. The amount of the invested funds of the university, exclusive of the value of the grounds, buildings, books, and apparatus, was, Aug. 31, 1879, \$3,902,181.73. The whole number of bound volumes in the college library and the department libraries is about 200,000, of bound volumes, and pamphlets, about 500,000. The present president of Harvard university is Charles William Eliot, LL.D., a graduate of the class of 1853. He was elected to the office in 1869, and to his administration have been chiefly due the distinguishing changes which have marked the recent management of the university, especially in the introduction of the elective system in the college proper and in lengthening the term of study required in the law and medical schools. The government of the university, which, for a generation after the schism which divided the New England Congregational churches in the first quarter of the present century, was under Unitarian control, is now neutral in its attitude towards religion.

HARVEY, a co. in s. central Kansas on the Little Arkansas river, crossed by the Atchison, Topeka and Santa Fé railroad; 540 sq.m.; pop. '78, 8,107. It has a level surface and is nearly all prairie. Soil fertile, producing corn, wheat, oats, etc. Co. seat, Newton.

HASAN AND HUSEIN, the title of a passion-play, performed annually throughout India and Persia by a traveling company of Shiah Mohammedans. The title of the piece presents also the names of its heroes, two brothers nearly related to Mohammed, the first of whom was caliph after Ali, the son-in-law of Mohammed. The two brothers, in whom rested the title to the office of guardian of the caaba or temple of Mecca, were foully assassinated, which act gave rise to the formation of the party known as Shiah, or "sectarian" Mohammedans, and produced a schism in Islam, which exists to this day.

HASKELL, a co. in n. Texas on the Brazos river; 1000 sq. miles. There are as yet no considerable settlements; the census of 1870 returned "no population."

HASSAN, a district of Mysore, India, bounded on the s.w. by the Madras district of south Kanara, and on the s. partly by the state of Coorg, 3,291 sq.m.; pop. '71, 669,961. The main portion of the district consists of the river basin of the Hemavati and its tributaries. It naturally divides into two portions, the Melnad or hill country, which includes some of the highest ranges of the west Ghats, and the Maidan or plain country, sloping towards the south. The Hemavati which flows into the Cauvery in the extreme s. is the great river of the district; its most important tributary is the Yagachi. The upper slopes of the w. Ghats are abundantly clothed with magnificent forests, and wild animals of all sorts abound. Among the mineral products are kaolin, feldspar, and quartz. The soil of the valleys is a rich red alluvial loam.

HASSARD, JOHN R. G., b. New York 1836; graduated at St. John's (Jesuit) college. In 1865 he edited the *Catholic World*, and in 1866 joined the editorial staff of the *New York Tribune*. He published the *Life of Archbishop Hughes* soon after the death of that prelate. He has gained repute as a graphic correspondent, and also as a musical critic of rare capacity and judgment. In the summer of 1876 Mr. Hassard attended the remarkable musical festival at Baireuth, the performance of Wagner's *Nibelungen Ring*, under the direction of the composer, and wrote perhaps the most complete description and criticism of the performance, for the *New York Tribune*, in which he also described with great brilliancy, the centennial exhibition, 1876, and the Cincinnati musical festival, 1878.

HASSAUREK, FRIEDRICH, b. Austria 1832; was in the revolution of 1848, and wounded. The next year he came to America and settled in Cincinnati as a lawyer, afterwards went into journalism, and became prominent as a politician. He was U. S.

minister in Ecuador 1861-5, and published his observations (1868) in *Four Years Among the Spanish Americans*. He is, at present (1880), editor of the Cincinnati (O.) *Volksblatt*.

HASSELQUIST, FREDRIK, 1722-52; a Swedish naturalist and traveler. In 1741 he entered the university at Upsala, where his taste for the study of nature was fostered and developed by Linnæus, and where, in 1747, he obtained license in medicine, and published a thesis entitled *De Viribus Plantarum*. On account of the frequently expressed regrets of Linnæus at the lack of information regarding the natural history of Palestine, Hasselquist resolved to undertake a journey to that country, and, a sufficient subscription having been obtained to defray expenses, he, after making himself acquainted with the languages of the Levant, embarked for Smyrna, where he arrived 1749. He visited parts of Asia Minor, Egypt, Cyprus and Palestine, and made large natural history collections; but his constitution, naturally weak, gave way under the fatigues and anxiety of travel, and he died at Smyrna, on his way homewards. His collection reached home in safety, and five years after his death the result of his wanderings were published by Linnæus under the title of *Resa till Heligt Landet förättad från år 1749 till 1752*. The work is divided into two parts, the first consisting of the traveler's journal and letters, and the second of his remarks on the botany, zoology and mineralogy of the countries through which he passed, with observations on the prevalent diseases and their cure, and the state of industry, commerce and the arts. It was translated into French and German in 1762, and into English in 1766.

HASSLER, FERDINAND RUDOLPH, 1770-1843; b. Switzerland. He came to America when young, and in 1807 was professor of mathematics in the West Point military academy. He was the first superintendent of the U. S. coast survey, and for many years was chief director of that important work. He was afterwards at the head of the bureau of weights and measures in the treasury department. Among his publications are text-books on science, *System of the Universe*, and valuable reports to congress on weights and measures and other topics.

HASSLER EXPEDITION. The name given to the U. S. coast survey expedition of 1871, on board the steamer *Hassler*, so called in honor of the first superintendent of the coast survey. The expedition included prof. Agassiz, Dr. F. Steindacher of Vienna, ichthyologist; Dr. Thomas Hill of Cambridge, botanist and photographer; Dr. White of Philadelphia, photographer and chemist; J. H. Blake of Cambridge, draughtsman and collector, and L. F. Pourtales of the coast survey, as superintendent of dredging. Mrs. Agassiz was also one of the party. The steamer left Boston Dec. 4, 1871, stopping at St. Thomas, Barbadoes, Pernambuco, Rio Janeiro, Montevideo, San Mathias bay (Patagonia), Possession bay (straits of Magellan), and various other places in the straits; on the coast of Chili, at San Carlos, Lota and Talcahuana; the island of Juan Fernandez, Valparaiso, Caldera, Pisco, Callao, Payta, the Galapagos islands, Panama, Acapulco, Magdalena bay, San Diego, and lastly San Francisco, arriving in Aug., 1872. Reports were made and published of the zoological results of the expedition, but the death of prof. Agassiz prevented the publication of his own valuable scientific observations.

HASTINGS, a co. in central Ontario, Canada, traversed by the Grand Trunk railway; 2,337 sq.m.; pop. '71, 48,364. There are many small lakes and streams. Gold has been found. Chief town, Belleville.

HASTINGS, a city and seat of justice in Dakota co., Minn., at the junction of Vermillion river with the Mississippi, on the Chicago, Milwaukee and St. Paul, and at the terminus of the Hastings and Dakota railroads, 20 m. s.e. of St. Paul; pop. 3,644. The city has a court-house, nearly a dozen churches, three newspapers, and a large number of manufactories. There is a railroad bridge across the Mississippi.

HASTINGS, FRANCIS RAWDON, Marquis of; 1754-1826, b. England. He joined the army in his 17th year, and his life thenceforth was entirely spent in the service of his country. From 1773 to 1782 he was engaged with much distinction in the American war, fighting at Bunker hill, Monmouth, Camden, and in other battles. From 1783 to 1813 he held various high appointments at home, and took an active part in the business of the house of lords; from 1813 to 1823 he was governor-general of India, and succeeded in bringing to a happy conclusion the Nepaul war. In 1824-26 he was governor of Malta.

HASTINGS, THOMAS, 1784-1872; b. Conn.; when 12 years old removed to Clinton, N. Y. He became interested in sacred music, and made its study and improvement the chief business of his life. From 1824 to 1832 he edited a religious paper in Utica; then came to New York city as musical instructor and composer, where he published, among other works, *Spiritual Songs*, *Christian Psalmist*, *Mother's Hymn Book*, *History of Forty Choirs*, and *Elements of Vocal Music*.

HATCH, EDWARD, b. Me.; early removed to Iowa. In the war of the rebellion he was a col. in command at New Madrid, Island No. Ten, and Corinth, and afterwards commander of a division in Tennessee. He was brig.gen. of cavalry in the contests at Franklin and Nashville, and in the pursuit of Hood's army. In 1866 he was made col. of the 9th U. S. cavalry.

HATCH, JOHN P., b. New York, 1822; a graduate of West Point; served in the Mexican war and against the Indians. In the war of the rebellion he was brig. gen. of volunteers, commanding cavalry in northern Virginia, and was seriously wounded at South Mountain. He was brevetted maj. gen. for gallantry. After the war he was made col. of the 4th (regular) cavalry.

HATFIELD, EDWIN FRANCIS, D.D., b. N. J., 1807; graduated at Middlebury college, and studied theology at Andover. He was ordained in New York in 1832; was pastor in St. Louis; then of the Seventh, and later of the North Presbyterian church, New York city. He was for a time agent for the Union theological seminary, and for many years clerk of the Presbyterian general assembly. He has published *Universalism as it Is*; *St. Helena and the Cape of Good Hope*; *The History of Elizabeth, N. J.*; *The Church Hymn-Book, with Tunes*; *The Chapel Hymn-Book*. He also edited *The New York Observer Year-Book* for 1871 and following years.

HAT MANUFACTURE (see *HAT, ante*). Until recent times hats were principally made by the process of felting, and as tradition ascribed the discovery of that very ancient operation to St. Clement, he was assumed as the patron saint of the craft, and the annual festival of the trade continues to be held on his day, the 23d of November. Felt hats are now made of three different kinds, plain soft, plain hard, and "napped" or "ruffed" felts. There is a great range in the quality of felt hats, the finer and more expensive qualities being made entirely of fur; for the commoner qualities a mixture of fur and Saxony wool is used; and for the lowest kinds wool alone is employed. The processes and apparatus necessary for making hats of fur differ also from those required in the case of woolen bodies; and in large manufactories, especially in America, machinery is generally employed for operations which at no distant day were entirely manual. In the smaller factories, and for special objects, the old hand processes are still in operation. Hatter's fur consists principally of the hair of rabbits (technically called coneys) and hares, with some proportion of nutria, musquash, and beaver's hair; and generally any parings or cuttings from furriers are also used. Furs intended for felting are deprived of their long, coarse hairs, after which they are treated with a solution of nitrate of mercury, an operation called *carroting* or *secretage*, whereby the felting properties of the fur are greatly increased. The fur is then cut by hand or machine from the skin, and in this state it is delivered to the hat maker. A considerable trade in rabbit fur for hat making is maintained between Great Britain and the United States. The silk hat, which has now become so co-extensive with civilization, is an article of recent general introduction. It was known in Florence about a century ago; but its manufacture was not introduced into France till about 1825, and its development has taken place entirely since that period. A silk hat consists of a light stiff body covered with a plush of silk, the manufacture of which in a brilliant glossy condition is the most important element in the industry; and in that manufacture the French and American styles are in large demand. Originally the bodies were made of felt and various other materials, but now calico is almost exclusively used. The calico is first stiffened with a varnish of shellac, and then cut into pieces sufficient for crown, side, and brim. The side-piece is wound round a wooden hat block, and its edges are joined by hot ironing, and the crown piece is put on and similarly attached to the side. The brim, consisting of three thicknesses of calico cemented together, is now slipped over and brought to its position, and thereafter a second side-piece and another crown are cemented on. The whole of the body, thus prepared, now receives a coat of size, and subsequently it is varnished over, and thus it is ready for the operation of covering. In covering this body, the under brim, generally of merino, is first attached, then the upper brim, and lastly the crown and side sewed together are drawn over. All these by hot ironing and stretching are drawn smooth and tight, and as the varnish of the body softens with the heat, body and cover adhere all over to each other without wrinkle or pucker. Dressing and polishing, by means of damping, brushing, and ironing, come next, after which the hat is "velured" in a revolving machine by the application of haircloth and velvet velures, which cleans the nap and gives a smooth, and glossy surface. The brim has then only to be bound, the linings inserted, and the brim finally curled, when the hat is ready for use. In all kinds of hat-making the French excel, and in such centers as Anduze, Lyons, and Paris the trade is very extensive and important. In Great Britain the felt hat trade is principally centered at Denton and other localities in the neighborhood of Manchester, and in America the states of New York and New Jersey enjoy the greater part of the industry. According to the census of 1870 the statistics of hat manufacture in the United States were as follows: Hat and cap establishments, 483; hands employed, 16,173; capital, \$6,489,571; wages, \$6,574,490; materials, \$12,262,107; products, \$24,848,167.

HAUGIANS, a sect in Norway, the followers of Hans Nielsen Hauge (1771-1824). He was an enthusiastic revival preacher and so annoying to the regular clergy that they procured his punishment by fine and imprisonment. He held that the ministry is a common duty, and that ordination for the service is not necessary; that church creeds and confessions are of small account, but faith and works are everything, and he laid much stress upon strict discipline. The sect, though local, is still numerous.

HAUKSBEE, or HAWKSBBE, FRANCIS, b. England about 1690; a natural philosopher, the earliest to note electrical attraction and repulsion, and to observe the production of light in a vacuum and in open air. He wrote *Physico-Mechanical Experiments on Various Subjects*.

HAUPT, HERMAN, b. Penn. 1817; graduated at West Point, and after obtaining his commission, immediately resigned from the army, and became a civil engineer, and in 1844 was professor of that science in Pennsylvania college. He was for many years engaged as first assistant engineer on the Pennsylvania railroad, and afterwards rose to be chief engineer, and a director of that company. He was chief engineer of the Hoosac tunnel. During the war of the rebellion he was chief of the bureau of military railroads. In 1875 he was general manager of the Piedmont air line railway.

HAUPT, MORITZ, 1808-74; b. Germany; a noted philologist. On finishing his university course he devoted seven years to study of Greek, Latin, German, Old French, Provençal and Bohemian. In 1837 he became a teacher at the university of Leipsic, and his first lectures, dealing with such diverse subjects as *Catullus* and the *Nibelungenlied*, indicated the two-fold direction of his labors. He was chosen to the new chair of German language and literature, founded in his behoof, and in 1842 married Louise Herman, the daughter of his master and colleague. Having taken part in 1849 with Otto Jahn and Theodor Mommsen in a political agitation for the maintenance of the imperial constitution, he was deprived of his professorship two years later; however, he was called to succeed Lachmann at the university of Berlin; and at the same time the Berlin academy, which had made him a corresponding member in 1841, elected him an ordinary member. For 21 years he held a prominent place among the scholars of the Prussian capital.

HAUPTMANN, MORITZ, 1792-1868; was well known as a composer, but of greater importance as a writer on the theory of music. He was educated as a musician, and under Spohr he studied the violin. His opera, *Mathilde*, was very successful, but it was not until he succeeded Johann Sebastian Bach, as cantor at the Thomas school of Leipsic that his genius as a teacher was universally acknowledged. His pupils, all more or less distinguished, cherished an enthusiastic admiration for him, and at his death Leipsic was in mourning. He embodied the result of many years' labors in his *Die Natur der Harmonik und Metrik*.

HAURAN, a district in Syria, e. of the Jordan and s. of Damascus. It is a volcanic region, and scattered over it are the ruins of a vast number of ancient towns. The land belongs to the government; it is fertile, but only grain is cultivated. Scarcely a tree can be seen. The country abounds in artificial caves which once served as cisterns or granaries. Eshmiskin is considered the capital, and is the residence of the chief of all the sheiks. The people are chiefly Mohammedans and dress like the Bedonins. In ancient times the Hauran was one of the four provinces of Bashan.

HAURÉAU, JEAN BARTHÉLEMY, b. France, 1812; after leaving college, became an editor at Le Mans. In 1848 he was made keeper of the manuscripts in the national library, and chosen a member of the constituent assembly. In 1861 he became librarian of the order of advocates, and president of the academy of inscriptions and belles lettres. Among his works are *De la Philosophie Scolastique*; *François I. et sa Cour*; *Charlemagne et sa Cour*; and *Gallia Christiana*, a continuation of the Benedictine history of Christianity in Gaul.

HAUSSMANN, GEORGES EUGÈNE, Baron; b. Paris, 1809; educated at the conservatory of music, and became an advocate. After the revolution of 1830 he was successively sous-préfet of Nerac, Saint-Girons, and Blaye, and under the presidency of Louis Napoleon, was préfet of Var, the Yonne, and Gironde. He was appointed préfet of the Seine in 1853, and under his direction Paris was almost rendered a new city. Among his works were the improvement of the Bois de Boulogne, the prolongation of the Rue de Rivoli, the construction of the boulevard de Sebastopol, and of more than 20 boulevards in the old parts of Paris, various public gardens, squares, barracks, the halles centrales, the new prefectures of police, more than a dozen bridges, and the rebuilding of various mairies, in addition to numerous hospitals, asylums (especially the Hotel Dieu). After several loans had been contracted for the purpose of carrying out these improvements, the municipality of Paris, acting under the powers conferred upon them by special laws, raised a further sum of 250,000,000 francs in 1865, and 260,000,000 in 1869. On the formation of a parliamentary cabinet by M. Emile Olivier, Haussmann was asked to resign his office, and on his refusal was "relieved" by an imperial decree, dated Jan. 5, 1870. He received the decoration of grand officer of the legion of honor, 1856, and grand cross, 1862. In 1857 he was created a senator, and elected a member of the academy of fine arts. He was likewise a member of the imperial council of public instruction. After the fall of the empire he quitted France for a time. On his return he was appointed director of the Crédit Mobilier, and in this capacity he did much to restore the influence and improve the situation of that financial institution. At the election of Oct. 1, 1877, he was returned to the chamber of deputies by the arrondissement of Ajaccio in Corsica, his candidature having received the official approbation of the government.

HAUTE-LOIRE. See LOIRE, HAUTE, *ante*.

HAUTE-MARNE. See MARNE, HAUTE.

HAUTE-PYRÉNÉES. See PYRÉNÉES, HAUTE, *ante*.

HAUTES-ALPES. See ALPES, *ante*.

HAUTE-SAÔNE. See SAÔNE, HAUTE, *ante*.

HAUTE-SAVOIE. See SAVOY, *ante*.

HAUTE-VIENNE. See VIENNE, HAUTE, *ante*.

HAUT-RHIN. See RHIN, HAUT, *ante*.

HAÛY, VALENTIN, 1745-1822; b. France, a brother of René Just, the mineralogist. Valentin devoted great attention to the blind, for whose education he invented ingenious apparatus in the form of raised maps and letters. His first pupil was a blind beggar, who afterward himself became a teacher. In the first year of his school Haüy had 24 pupils. The school attracted general attention and prospered rapidly, many of its pupils becoming proficient in music and mathematics. In 1806 he was called to St. Petersburg by the emperor, and there founded a similar school; and about the same time promoted the establishment of a school in Berlin.

HAVANA (*ante*). In 1873 the population of Havana had increased to 230,000, doubtless owing to the arrival of soldiers from Spain. A large and constantly growing commerce brings Havana into association with the leading commercial countries, American ships leading in number among the foreign arrivals. The chief manufacturing industry is that of tobacco, of which there was exported in 1878, 13,864,800 lbs., and 174,638,000 of cigars. Another important article of exportation is sugar, which with rum, molasses, fruits, etc., makes up a very valuable trade. Havana is noted for its thoroughfares and public parks—the *paseo de Tacon*, *plaza de Armas*, *Alameda de Paula*, and *parque de Isabel*—which are unequaled in any other city. The houses are low, with flat roofs, massively constructed, and of the general architecture common to southern Spain. Water is introduced into the city from a distance of 7 m., and there are more than 50 public fountains. Havana is a very unclean and a very noisy city. The sewerage is bad, and the arrangements for street cleaning are not effective. The number of public and private vehicles, apparently in constant use, is so great as to produce a turmoil and confusion which are not paralleled elsewhere. It is said that there are 6,000 victorias and innumerable volantes in the city, besides other vehicles, and the mode of driving is reckless and noisy.

HAVEMEYER, WILLIAM F., 1804-74; b. New York; graduated at Columbia college, and was for many years a manufacturer of sugars. He was three times elected mayor of the city, and died while in office.

HAVEN, ALICE BRADLEY; 1828-63; b. New York; maiden name Emily Bradley. While at school she sent sketches to the Philadelphia *Saturday Gazette* signed "Alice G. Lee." In 1846 she married the editor of the *Gazette* (Joseph C. Neal), and wrote under the name of "Cousin Alice." After her husband's death, in 1847, she managed the paper for a number of years. In 1853 she was married to Samuel G. Haven. Among her publications are *The Gossips of River town*, and a long list of books for the young such as *Helen Morton*; *No such Word as Fail*; *Out of Debt out of Danger*, etc.

HAVEN, ERASTUS OTIS, D.D., LL.D., b. Boston, 1820; graduated at Wesleyan university; was a teacher in Amenia seminary, and became an itinerant Methodist minister, laboring about six years in and near New York. In 1853 he was professor of Greek and Latin in Michigan university; in 1856, editor of *Zion's Herald*, Boston. He was twice in the Massachusetts senate, where he was an earnest advocate of educational interests; he was also a member of the state board of education. In 1863 he was chosen president of Michigan university; in 1869, president of the Northwestern university (Evanston, Ill.); in 1872 corresponding secretary of the Methodist Episcopal board of education; in 1874, chancellor of the university at Syracuse, N. Y. Among his works are *The Young Man Advised*; *Pillars of Truth*, and *Rhetoric*; a *Text book for Schools*.

HAVEN, GILBERT, 1821-80; b. Mass.; graduated at Wesleyan university; taught Greek and Latin in Amenia seminary for two years, and was chosen principal in 1848. In 1851 he joined the New England conference, and preached successively in several large towns. He was chaplain of a Massachusetts regiment in the war of the rebellion. In 1862 he traveled in Europe, and on return was two years a preacher in Boston. In 1867 he was the editor of *Zion's Herald*, holding the place until elected bishop in 1872. For some years he had manifested great interest in the welfare of the colored people, especially those in the southern states where (in Mississippi) he had supervision of relief for destitute freedmen. As bishop of the M. E. church, he was stationed at Atlanta, Geo., with special charge of the interests of the church in the adjoining southern states. He was an earnest advocate of Protestant missions among Italian and Spanish people, and in that interest made a trip to Mexico. Some of his publications are *The Pilgrim's Wallet*; *National Sermons*; and *Sermons, Speeches, and Letters on Slavery and its War*.

HAVEN, JOSEPH D.D., LL.D., 1816-74; b. Mass.; graduated at Amherst, and studied in Union theological seminary (N. Y.); graduated at Andover in 1839. After officiating

as pastor in Congregational churches in Brookline and Ashland, Mass., he was chosen professor of moral and mental philosophy in Amherst college; afterwards of systematic theology in the Chicago seminary. In 1870 he traveled in Europe and the east. In 1874 he was professor of mental and moral philosophy in Chicago university. He published *Mental Philosophy*, *Moral Philosophy* (text books), and *Studies in Philosophy and Theology*.

HAVERFORD COLLEGE, in Delaware co., Penn., was founded in 1833 by orthodox Friends. It was known at first as "Haverford school," but it was made a college, with power to confer degrees, about 1850. It possesses a farm of more than 100 acres of fertile land, and a shaded lawn of 60 acres, beautifully laid out. It has accommodations for only 60 resident students. It is in high repute for thoroughness in whatever it undertakes to teach, and especially for its watchfulness over the morals of its students. Since 1849 it has been open for other than the sons of Friends. Besides the main college building it has a commodious edifice known as "library and alumni hall." The library contains 10,000 volumes. The students are trained with great care and thoroughness, with special reference to the highest moral development. This is the first collegiate institution founded and conducted by Friends alone, and it has done much to raise the standard of intellectual culture among that eminently practical people. It is sectarian only in a very mild way, and has many strong attractions for students of other religious denominations. It has 5 instructors and 60 students. President, Thomas Chase, a graduate of Harvard.

HAVERHILL (*ante*), a handsome city in Essex co., Mass., built on hills sloping down to the Merrimack river. The chief business is shoe manufacturing in which no town exceeds it except Lynn. There are about 7,000 persons engaged in the trade. There are 19 churches, 5 newspapers, a masonic temple, and a public library (20,000 vols.) in a fine building including a hall of statuary. The city hall is also a fine edifice. Haverhill is the birthplace of the poet Whittier. It was settled in 1640. In 1698 the Indians made an assault on the place, capturing Mrs. Hannah Dustin, with her child (six days old) and nurse. The child they killed, and after a long march through the woods towards Canada came near one of their villages. They told the women that they would be compelled to run the gauntlet for the amusement of the Indians; but that night Mrs. Dustin the nurse, and a young English boy (who was also a captive) silently arose, killed ten of the twelve Indians, scalped them, and in a bark canoe went down a river safely reaching home. In 1708 the French and Indians attacked Haverhill and killed or captured 40 persons.

HAVRE DE GRACE, a village at the n. extremity of Chesapeake bay, in Harford co., Maryland; on the Philadelphia, Wilmington and Baltimore railroad and at the mouth of Susquehanna river, 36 m. e.n.e. of Baltimore; pop. 3,000. There is a railroad bridge across the river more than 1000 yards long. There are several churches, one newspaper, a high school, and a number of manufactories. The village was burned by the English in the war of 1812.

HAWARDEN, a t. in Wales, in Flintshire, 8 m. s.w. of Chester; situated on an eminence commanding an extensive prospect. It lies in the midst of a coal district, and near it are valuable clay-beds. The most important business is the manufacture of coarse earthenware, draining tiles, and fire-clay bricks. The family of Maude derive the title of viscount from the town. Pop. '71 of the township, 6,782; of the parish, (including Saltney), 8,683. In the neighborhood is Hawarden castle, built in 1752, and added to and altered in the Gothic style in 1814; it stands near the ruins of the old castle of that name which was granted by the conqueror to his nephew Hugh Lupus, which after many vicissitudes came into the possession of sergeant Glynne, lord chief-justice of England under Cromwell. On the death in 1874 of sir Stephen R. Glynne, the last of a line of baronets, the castle passed to his brother-in-law, the eminent statesman, Mr. W. E. Gladstone.

HAWES, JOEL, D.D., 1789-1867; b. Mass.; graduated at Brown university, and studied theology at Andover. In 1818 he became pastor of the first Congregational church in Hartford, Conn. Among his published works are: *Lectures to Young Men; Character Everything to the Young; The Religion of the East; Looking-glass for Ladies, or the Formation and Excellence of Female Character*, etc.

HAWKBIT, the fall dandelion, a perennial plant of Europe, grown in some parts of the United States. It bears yellow flowers resembling dandelions, and is plentiful from July to Oct. in the eastern states.

HAWKE, EDWARD, Baron, 1705-81; an English admiral. In the naval engagement at Toulon in 1744 he broke from the line of battle in order to engage the *Poder*, and succeeded in compelling her to strike her colors; but his breach of discipline was punished by dismissal from the service. He was, however, restored by the king, and in 1747 was promoted to the rank of rear-admiral of the white. In Oct. of the same year he commanded a squadron sent to intercept a fleet of French merchant vessels bound for the West Indies under a convoy of nine men-of-war, and coming up with them on the 14th near the isle of Aix, he succeeded in capturing six of the men-of-war, but darkness coming on before the close of the contest, all the merchant vessels escaped. For his victory he was created a knight companion of the Bath. In Dec. of the same year he

was chosen member of parliament for Bristol. In May, 1748, he became vice-admiral of the blue, and in Jan., 1755, admiral of the white. In 1756 he succeeded admiral Byng as commander of the fleet in the Mediterranean. In 1759 he took charge of a squadron sent to cruise off Brest. On the morning of Nov. 20 he sighted the French fleet under admiral Conflans, off Belleisle, and notwithstanding that the French, trusting to their knowledge of the rocks and shallows, retired towards the shore, he engaged them with such impetuosity that their fleet was only saved from total destruction by the approach of night. As it was, more than half of their vessels were either disabled, captured, or driven on shore. For this brilliant victory, gained with the loss of only two vessels, Hawke received the thanks of the house of commons, and a pension of £2,000 per annum. In 1765 he was appointed vice-admiral of Great Britain, and first lord of the admiralty. In 1776 he was raised to the peerage by the title of baron Hawke of Towton.

HAWKESWORTH, JOHN, 1715-73; b. London. He is said to have been apprenticed at first to a clockmaker and afterwards to an attorney. In 1744 he succeeded Dr. Johnson as compiler of the parliamentary debates for the *Gentleman's Magazine*. Eight years later he started in company with Johnson, Bathurst, and Warton a periodical called the *Adventurer*. This journal had a great success, and ran to 140 numbers, of which 70 were from the pen of Hawkesworth himself. In 1761 he published a volume of fairy tales, and an edition of Swift's works and letters, with a life prefixed which Johnson referred to in highly laudatory terms in his *Lives of the Poets*. He edited the papers of capt. Cook relative to his first voyage, published in 1773 in three volumes, and as a reward of his labors Hawkesworth received from the government the sum of £6,000. His descriptions of the manners and customs of the new world were, however, regarded by many critics as hurtful to the interests of morality, and the severity of their strictures is said to have hastened his death.

HAWKING. See **FALCONRY**, *ante*.

HAWKINS, a co. in e. Tennessee on the Virginia border, intersected by Holston river, and reached by the East Tennessee and Virginia railroad; 440 sq.m.; pop. '70, 15,837—1889 colored. Clinch mountain and other ridges are prominent features. Chief productions: corn, oats, and butter. Co. seat, Rogersville.

HAWKINS, BENJAMIN WATERHOUSE, b. London 1807; an artist excelling in painting animals. He lived at Knowsley, the seat of the late earl of Derby (at the earl's invitation) where for five years he studied animal portraiture. He was assistant superintendent of the international exhibition of 1851, and in 1852, the crystal palace company employed him to make restorations of extinct animals, in which art he was an expert. In 1868 he lectured in New York and other cities of the United States, and afterwards resided in this country. Here he was employed by the central park commissioners of New York, in restoring the forms of extinct creatures, but later administrations rejected his work, much of which was destroyed. Some specimens, however, exist in the Smithsonian institution collection. He has written *Elements of Form, Comparative View of the Human and Animal Frame*, *Popular Comparative Anatomy*, etc.

HAWKINS, Sir JOHN, 1719-89; b. England; destined for an architect, but took to the law, devoting his leisure hours to his favorite study of music. A wealthy marriage in 1753 enabled him to indulge his passion for acquiring rare works of music, and he bought the collection formed by Dr. Pepusit, and subsequently presented by Hawkins to the British museum. It was on such materials that Hawkins founded his celebrated work on the *General History of the Science and Practice of Music* (1776), which is less a systematic treatise than a collection of rare and valuable pieces of music with a more or less continuous commentary. He also made occasional contributions to the *Gentleman's Magazine*, edited the *Complete Angler*, and wrote a biography of Dr. Johnson, with whom he was intimately acquainted. He was one of the original members of the Ivy Lane club, and ultimately became one of Dr. Johnson's executors.

HAWKSHAW, JOHN, b. England. 1811, and educated there; afterwards turned his attention to engineering. At the age of 20 he was sent out to superintend certain copper mines in South America. He returned to England in 1834, and had charge of important railway and other engineering works; was one of the London commission of sewers, and president of the institution of civil engineers. In 1870 he proposed a submarine tunnel under the straits of Dover. He was knighted in 1873, and president of the British association in 1875. He has published *Reminiscences of South America*, and papers on engineering. Besides his labors in England, Hawkshaw became connected with some of the most important engineering works of Europe, including railroads in Russia, a ship-canal connecting Amsterdam with the North sea, the Madras and Eastern Bengal railway, the government railways in Mauritius, etc.

HAWLEY, GIDEON, 1727-1807; b. Conn.; graduated at Yale, and began missionary work among the Indians at Stockbridge in 1752. Two years later he undertook a mission among the Iroquois on the Susquehanna river, but was driven out in 1756 by the French and Indian war. The latter part of his life was passed in missionary duties in Marshpee, Mass.

HAWLEY, JOSEPH, 1724-88; b. Mass.; graduate at Yale in 1742. He began to preach, but gave up the pulpit for the practice of the law, and became a leading advocate. He was in the house of representatives from 1764 to 1776, and took a prominent position as a friend of freedom from Great Britain. In religious matters he was at first a firm opponent of the theories taught by Jonathan Edwards, but late in life he became their equally firm supporter.

HAWLEY, JOSEPH ROSWELL, b. N. C., 1826, of Connecticut parents, who 11 years after returned to that state. He graduated at Hamilton college, studied law, and began practice in Hartford. In 1857 he became the editor of the *Evening Press*, a newly established republican newspaper. He soon became prominent as a republican writer and speaker. When the rebellion began, he was the first citizen of his state to volunteer on the union side. He entered the service as capt., and was with his company in the battle of Bull Run. He served in various battles, and throughout the war, and was mustered out as brevet-maj.gen. In 1866 he was chosen governor of his state, and when he retired he returned to editorial work on the Hartford *Courant* with which the *Press* had been consolidated. Hawley was president of the republican national convention at Chicago in 1868. In 1872 he was chosen member of congress, and was re-elected in 1873. In 1876 he was president of the centennial commission, and was largely instrumental in elaborating and organizing the system of management of the international exhibition at Philadelphia.

HAWTHORNE, JULIAN, b. Boston, 1846; son of Nathaniel. He was in Europe from 1853 to 1860. In 1863 he was a pupil in Harvard college, but did not graduate. In 1868 he went to Germany to study engineering, and in 1870-72 he was employed as an engineer by the dock department of New York. In 1872 he made his permanent residence in Dresden, Germany. He has displayed much force and originality as a novelist, publishing *Bressant*, *Idolatry*, *Garth*, and many light sketches.

HAXO, FRANÇOIS BENOÎT; baron, 1774-1838; b. France; gen. of engineers. He was concerned in a number of sieges, and constructed many important fortifications. The "Haxo casemate" is a work built inside the parapet, arched, and covered with earth, opening in the rear to the terreplein. The guns are protected from the enemy's fire, and can be entirely hidden by masking the embrasures.

HAY, JOHN; b. Ill., 1839; educated at Brown university; admitted to the Illinois bar, and in 1861 was private secretary to president Lincoln. For a time after the assassination of the president, he served as staff officer in the army. In 1865 he was secretary of the American legation in Paris, and in 1868 in the same position in Madrid. He returned in 1870, and took an editorial position on the *New York Tribune*. He has published *Pike County Ballads* and *Castilian Days*.

HAYDEN, FERDINAND VANDEVEER; b. Mass., 1829; graduated at Oberlin college; studied medicine in Albany, and took his degree (Albany medical college) in 1853. In that year he commenced the series of scientific explorations which have made his name famous by an examination of the remains of extinct animals found in the "bad lands" of Dakota. The next three years were passed in a similar exploration of the upper Missouri, resulting in the discovery of an important collection of fossils, which was afterwards divided between the academies of science of St. Louis and Philadelphia. Being appointed geologist of a government expedition to the northwest, he acted in this capacity until the outbreak of the rebellion, when he entered the union army as a surgeon. He rose to be chief medical officer of the army of the Shenandoah. In 1865, and until 1872, he was professor of geology and mineralogy in the university of Pennsylvania, vacating this post on account of his duties in connection with the U. S. geological survey of the territories, which had been placed in his charge in 1867. The reports of the explorations for this survey have been printed by the U. S. government in octavo volumes, and with quarto volumes of illustrations. One important result of these reports was the setting apart by the U. S. government of the lands now forming the National park in the Yellowstone valley, covering a territory more than 3,500 sq.m. in area. Prof. Hayden's work has added to the reputation of this country for scientific exploration.

HAYDN, JOHN MICHAEL; 1737-1806; b. Germany; a brother of the great composer, and himself an organist and composer of merit. He was chapel-master at Salzburg, where he had a school of counterpoint. His works were many, and it is said that his brother thought him the foremost composer of sacred music of his time.

HAYDUCKS. See *Haiducks*, *ante*.

HAYEL, or HAIL, an Arabian city, capital of the sultanate of Shomer, about 250 m. n.e. of Medina; pop. 12,000. It is a walled town, with towers and gates, and room for 20 times as many inhabitants as it contains. The chief building is the sultan's palace which has a tall oval tower. Hayel is a place of considerable trade.

HAYES, RUTHERFORD BIRCHARD, LL.D., 19th president of the United States, was b. in Delaware, Ohio, Oct. 4, 1822. Both his paternal and maternal ancestry, it is claimed, can be traced back, each to a Scottish chieftain of noble blood, who fought side by side with Robert Bruce, and he is a descendant in the sixth generation of George

Hayes, who left Scotland in 1680 and settled at Windsor, Conn. His grandfather, Rutherford Hayes, born in New Haven, Conn., in 1756, settled in Brattleboro, Vt. Here the father of the president, also named Rutherford, was born. He married Sophia Birchard of Wilmington, Vt., in Sept., 1813, and soon afterwards emigrated to Delaware, Ohio, where he died less than three months before the birth of his now distinguished son. The widow found support in her bachelor brother, Sardis Birchard, who interested himself especially in the welfare of her youngest child. When the boy was 16 years of age his uncle sent him to Kenyon college, where he was graduated at the head of his class in 1842. He chose the profession of a lawyer and began his studies in the office of Thomas Sparrow, esq., of Columbus. Subsequently he spent two years as a student in the law school at Cambridge, Mass. In 1845 he was admitted to the bar at Marietta, Ohio, and soon afterwards entered into practice at Fremont, the residence of his uncle Sardis Birchard, then a wealthy banker. In 1849 he removed to Cincinnati, where he soon gained a remunerative practice. He became a member of the Cincinnati literary club, which embraced among its members Salmon P. Chase, gen. John Pope, gov. Edward F. Noyes, and other scarcely less distinguished men. He became prominent in his profession, important and difficult cases being confided to his care. He married about this time Miss Lucy Ware Webb. In 1856 he was nominated as a candidate for judge of the court of common pleas, but refused to accept the nomination. Two years later he was elected to the office of city solicitor, to fill a vacancy, and was afterwards elected for a full term by the popular vote. In 1861, when the rebellion broke out, his position at the bar was in the first rank, but he resolved to take part in the defense of the country. He enlisted for the whole war and was commissioned as maj. of the 23d Ohio volunteers, of which W. S. Rosecrans was col. The regiment was assigned the duty at Clarksburg, W. Va., to protect the Baltimore and Ohio railroad and defend the border from raids. Maj. Hayes took a prominent part in various expeditions necessary for the defense of the post. He served for a time as judge-advocate on gen. Rosecrans's staff, discharging his duties with such impartiality as to win universal praise. In the winter of 1861-62 he took a prominent part in various expeditions into the enemy's territory, and on several occasions narrowly escaped death. In Aug., 1862, he was promoted to the colonelcy of the 79th Ohio, but he preferred to remain, with the rank of lieut.col., with the 23d, which had been incorporated with Burnside's command in the army of the Potomac. Lee was now advancing toward Maryland, and the first effort to resist him was at South Mountain, where the 23d, led by Hayes, was hotly engaged. More than a hundred of Hayes's men fell dead or wounded under the enemy's fire and his own arm was broken. There was a pause for reinforcements, when a dangerous flank movement of the enemy was discovered, and Hayes, his arm bound up with handkerchief, was again seen at the head of the regiment. He was finally carried, fainting with loss of blood, from the field. He was laid up with his wounds during the eventful days of Antietam. Upon his recovery he was promoted to the rank of brig.gen. and placed in command of the Kanawha division, of which his old regiment formed a part. He remained at Kanawha Falls until Mar. 15, 1863, when the division was ordered to Charleston, W. Va. After this he led in several important expeditions, notably in that which he himself organized to dispute the retreat of Morgan and his band of guerillas after their raid through Ohio. By a quick movement he cut off Morgan's retreat and forced him to surrender. In the famous raid upon the Virginia and Tennessee railroad, in May, 1864, he led the principal assault upon the enemy's fortifications with admirable boldness and success. He took an honorable part in the attack on Lynchburg, June 18, covering the retreat of the union forces under dangerous conditions with perfect success. In the campaign of the Shenandoah, under Sheridan, his services were conspicuous and valiant. In the battle of Winchester especially, he displayed great coolness and courage in the most trying circumstances, and when Early, a month later, renewed the fight, Hayes's superb coolness in the midst of rout and confusion acted like magic upon his men, and saved Sheridan's train from capture. In this conflict, his horse, while at full speed, fell dead beneath him, throwing him from the saddle and bruising him very badly. It was at this crisis that Sheridan, who had been absent, arrived upon the scene, when the enemy was utterly routed. For his gallant services in the engagements, Hayes was brevetted maj.gen. He was a republican from the moment when the party was formed, and had taken an active part in the political campaign of 1860. His achievements in the war made his name a power in Ohio, and when the republicans of the 2d district felt the need of a popular candidate for congress, he consented to accept the nomination, with the understanding that he would not take the seat unless the war should meantime be ended. His party friends, feeling the need of a strong effort to secure his election, besought him to take part in the canvass. In reply to their entreaties he wrote: "Any man who would leave the army at this time to electioneer for congress ought to be scalped." He was elected by a large majority, but refused to take his seat until, as he said, he could "come by the way of Richmond." When, after the close of the war, he entered congress, he at once drew to himself the attention of the country by his conspicuous ability. He was re-elected in 1866, but had only served through his first term when the republicans of Ohio, in 1867, nominated him as their candidate for governor, under the conviction that he was the only man whom they could hope to elect. He was chosen by a majority of 3,000, and re-elected in 1869.

by a majority of 7,518. He was elected for the third time in 1875, and while occupying the place was nominated by the republican party as its candidate for president of the United States. The contest was severe and close, and after the election, disputes arose as to the electoral votes of several states. Great excitement followed, and fears were entertained of a civil commotion before the questions at issue could be settled. At length, however, it was agreed by the representatives of both political parties in congress to refer the questions in dispute to a commission composed of five senators, five representatives, and five judges of the supreme court of the United States, and to abide by its decision. The commission was appointed accordingly, and after hearing the parties upon the questions in dispute, it decided by vote of 8 to 7 (every republican voting with the majority and every democrat with the minority) that the electoral votes of the disputed states (Louisiana, South Carolina, Florida, and Oregon), should of right be given to Hayes; and he was thereby elected by a majority of one. He was inaugurated on Mar. 4, 1877. Aside from partisan disputes upon the questions adjudicated by the electoral commission, and from some of the incidents arising therefrom, his administration of the government is admitted by the best men of all parties to have been pure and honorable. In his letter accepting the republican nomination, he spoke freely of the evils and dangers resulting from the practice of regarding the offices of the national government as the "spoils" of the party in power, to be bestowed upon men as rewards for partisan services, and declared his belief that "the founders of the government meant that the officer should be secure in his tenure as long as his personal character remained untarnished and the performance of his duties satisfactory." He avowed his purpose, if elected, to conduct the administration of the government upon the principle of the fathers, and pledged himself that "all constitutional powers vested in the executive" should "be employed to establish this reform." As to the relations of the national government to the southern states and their people, concerning which there was at the time the deepest anxiety in all parts of the country, he said: "The moral and material prosperity of the southern states can be most effectually advanced by a hearty and generous recognition of the rights of all by all—a recognition without reserve or exception. With such a recognition fully accorded, it will be practicable to promote, by the influence of all legitimate agencies of the general government, the efforts of the people of those states to obtain for themselves the blessings of honest and capable local government. Let me assure my countrymen of the southern states that if I shall be charged with the duty of organizing an administration, it will be one which will regard and cherish their truest interests—the interests of the white and colored people both, and equally; and which will put forth its best efforts in behalf of a civil policy which will wipe out forever the distinction between north and south in our common country." Mr. Hayes believed that he owed his election to the confidence in him on the part of the electors, which these avowals created, and he felt in honor bound to fulfill his pledges whatever might be the ultimate effect upon his own popularity. Accordingly, in his inaugural address, he said: "I wish now, when every motive for misrepresentation has passed away, to repeat what was said before the election, trusting that my countrymen will candidly weigh and understand it, and that they will feel assured that the sentiments declared in accepting the nomination for the presidency will be the standard of my conduct in the path before me." He declared that while he was "in duty bound and fully determined to protect the rights of all by every constitutional means," he was "sincerely anxious to use every legitimate influence in favor of honest and efficient local self-government, as the true resource of those states for the promotion of the contentment and prosperity of their citizens;" and in his efforts to accomplish this purpose he "asked the cordial co-operation of all who cherished an interest in the welfare of the country, trusting that party ties and the prejudice of race" would "be freely surrendered in behalf of the great purpose to be accomplished." Universal suffrage, he declared, should rest upon universal education, and "to this end liberal and permanent provisions should be made for the support of free schools by the state government, and, if need be, supplemented by legitimate aid from national authority." Acknowledging that he owed his election to the suffrage and zealous labors of a political party, he nevertheless said he should "strive to be always mindful of the fact that he serves his party best who serves the country best." These avowals on the part of the president, though eminently satisfactory to a very large body of citizens, awakened distrust in the minds of many of the leaders of the republican party, and especially among the republican members of congress; and when, not long afterwards, after full inquiry and investigation, he deemed it his duty to withdraw the troops which his predecessor had ordered to be stationed in the state-houses of Louisiana and South Carolina, doing so upon the ground that there did not exist in those states "such domestic violence as is contemplated by the constitution as the ground upon which the military power of the national government may be invoked for the defense of the state," he was denounced by many prominent members of his party as having left the enfranchised negroes of those states without the protection to which they were entitled. But time has abundantly vindicated alike the rightfulness and the wisdom of his action; and there is every reason to believe that if his party had sustained him in the course which he pursued, the best interests of the country would thereby have been promoted. The president was equally unfortunate in failing to enlist the support of his party in his efforts to reform the civil service; but, in spite of the

hostility of politicians of all parties, he has been substantially true to his pledges and made the path of reform easier for his successors. Upon all political questions save those above referred to, he has been in harmony with the republican party, and by his courageous and unflinching exercise of the veto power has prevented the adoption of measures calculated to injure the credit of the country and prevent a return to specie payments. He has also, by the interposition of the same power, prevented the repeal of the laws enacted by congress, under the express authority of the constitution, to guard the purity of national elections.

HAY FEVER, HAY COLD, or HAY ASTHMA, an affection characterized by a subacute inflammation of the mucous membrane of the nasal passages, the eyes, and the bronchial tubes, with more or less febrile disturbance, headaches, and occasionally asthmatic paroxysms. The name would indicate that the emanations from hay were the sole cause, but this is not so. The odorant matter of many flowers is as potent a cause, perhaps, as any other. Different persons are no doubt affected by different substances, the more profound cause of the disease being rather the predisposition or idiosyncrasy of the person than the peculiarity of the impinging emanation. The disease appearing only in the summer and autumn, would indicate that the idiosyncrasy requires the stimulus of some peculiar emanations only produced by nature during those seasons; but there is probably a peculiar state of the system which is only developed at those times, and only in certain persons. That the presence of the peculiar matter is as important as the idiosyncrasy is indicated by the fact that the affection soon declines after the appearance of frost. The disease will continue to annoy the patient for several weeks unless he removes to a locality where the external cause does not exist, or succeeds in cutting it short by medical treatment, which, it is held, may sometimes be done. The complaint is rather more prevalent in America than in Europe. It will not be developed at sea, and, it is said, neither in northern Canada or the southern United States. Prof. Morrill Wyman, in a work on hay fever (1872), says there are two forms, one called the rose cold or June cold, corresponding to the affection known in England. The other form he calls autumn catarrh. Dr. Wyman states that going to cool mountain regions to any altitude above 800 ft. above the sea level, will give relief. Iodide of potassium, iodide of bromine, and strychnia are said to be useful as medicines, but it would be preferable to limit the treatment to removal to some locality where the disease is not developed. Prof. Helmholtz discovered minute vibrios in the mucous secretions of the air passages, upon the presence of which, it has been thought by some, the disease probably depends. The motions of these organisms have been arrested by quinine, and this drug has been suggested as a remedy, but no definite results have been obtained, and it is probably better, as above stated, to depend upon hygienic measures, including removal.

HAYNE, ISAAC, 1745-81; b. S. C. In 1780 he was a member of the state legislature. He was taken prisoner at the capture of Charleston, and required not to bear arms against the English, agreeing to which he was permitted to visit his family, then sick with small-pox. After Greene's successes, when the British held only Charleston, Hayne was required to take up arms for the king, but he fled to the American camp. He was made a col., but not long afterwards was captured and hung by order of lord Rawdon.

HAYNE, PAUL HAMILTON, b. S. C., 1830; educated at Charleston, and was connected as writer or editor with various periodicals there, the *Evening News*, the *Literary Gazette*, and *Russell's Magazine*. In 1854 he published a volume of poems of which the *Temptation of Venus* is the most noteworthy; a second volume of his poems appeared in 1857, and a third, called *Avolio*, in 1859. *The Mountain of the Lovers*, and *Other Poems*, and *Legends and Lyrics*, appeared in 1873, and the same year Mr. Hayne edited for publication the works of another southern poet, Henry Timrod. A complete revised edition of Mr. Hayne's work is now (1881) in press.

HAYNE, ROBERT YOUNG, 1791-1840; b. S. C.; educated in Charleston, and at the age of 21 admitted to the bar. He was a member of the legislature, speaker of the house, state attorney-general, and in 1823 a senator in congress. Here his enunciation of the doctrine that any state has the right to disobey and suspend such federal laws as its people might deem injurious to their interests, brought on the famous discussion between himself and Daniel Webster. The provocation was the tariff of 1824, which was strenuously opposed in South Carolina, and a state convention (Nov. 24, 1832) adopted an ordinance of nullification. As soon as the fact was known at Washington, president Jackson issued the famous proclamation in which he declared in substance, that nullification was treason, and that the union must and should be preserved. Hayne was then governor, and replied in a proclamation of defiance, and the state prepared to resist the enforcement of the tariff laws by arms. There was no collision, however, as congress speedily modified the tariff, and the state repealed the nullification ordinance. In 1834 Hayne was chosen mayor of Charleston.

HAYNES, JOHN, d. 1654; b. England; came to Boston in 1633, and two years later was chosen governor of Massachusetts colony. In 1629 he was the first governor of

Connecticut, and was re-elected every other year (as often as the law allowed) until his death. He was one of the five who prepared a written constitution for the colony, the first organic law drafted in the country, and said to embrace many of the cardinal principles of subsequent constitutions, federal and state.

HAYNES, LEMUEL, 1753-1834; a mulatto, b. Conn.; abandoned by his white mother and brought up as a servant, but educated as one of the children of a New England family. He volunteered in the revolutionary army, and was in the Ticonderoga expedition. In 1780 he worked at farming, and by firelight studied Greek and Latin and theology. In 1785 he was ordained, and was soon after settled at Rutland, Vt., where he labored 30 years. He afterwards preached in Manchester, Vt., and Granville, N. Y.

HAYS, a co. in s.w. Texas, on San Marcos river; 650 sq.m.; pop. '70, 4,088-1217 colored. Surface hilly; chief productions: corn and cotton. Co. seat, San Marcos.

HAYS, ISAAC, 1796-1879; b. Philadelphia; an American physician and scientist, graduated in 1816 of the department of arts, and in 1820 of that of medicine, in the Pennsylvania university. He edited two successive editions of Wilson's *American Ornithology*, besides several important medical and scientific works. He was sole editor from 1827 to 1869 of the *American Journal of the Medical Sciences*. He was president of the academy of natural sciences in Philadelphia from 1865 to 1869, and an active member of the philosophical society; also one of the founders of the Franklin institute, its secretary for several years, and at the time of his death its oldest member. He was one of the oldest members and for a time an officer of the college of physicians of Philadelphia; also one of the founders of the American medical association, and author of its code of ethics, which has been adopted by all the medical societies in the country.

HAYS, WILLIAM JACOB, 1830-75; a painter, who devoted his life chiefly to the painting of animals, in furtherance of which purpose he visited the upper waters of the Missouri, various northern states, and Nova Scotia. Some of his pictures are "The Herd in the Moor" (a herd of buffaloes); "The Prairie-Dog Village;" "A Bison Bull at Bay;" "Prairie on Fire;" and "Herd of Caribou in Nova Scotia." His latest work was in illustrating "The Ruminants of America."

HAYWOOD, a co. in w. North Carolina on Big Pigeon river; 700 sq.m.; pop. '70, 7,921-515 colored. It is in a rough region between Iron mountain and the Blue ridge, but the valleys are fertile; productions: corn, tobacco, butter, wool, &c. Co. seat, Waynesville.

HAYWOOD, a co. in w. Tennessee on Hatchee river, traversed by the Memphis and Louisville railroad; 500 sq.m.; pop. '70, 25,094-13,832 colored; in '80, 23,397. It is level, with considerable forest land. The soil is fertile; chief productions: cotton, corn, and pork. Co. seat, Brownsville.

HAZÁRA, or HUZARA, a British district in the Punjab, India, 2,771 sq.m.; pop. '68, 267,218. The district forms a wedge of territory extending far into the heart of the outer Himalayan range, and consisting of a long narrow valley, shut in on both sides by lofty mountains, whose peaks rise to a height of 17,000 ft. above sea level. Towards the center of the district the vale of Khagan is bounded by mountain chains, which sweep southward, still maintaining a general parallel direction, and send off spurs on every side which divide the country into numerous minor dales. The district is well watered by the tributaries of the Indus, the Kunhar, which flows through the Khagan valley into the Jhilam (Jhelum), and many rivulets. Throughout, the scenery is picturesque. To the north rise the distant peaks of the snow-clad ranges; midway, the mountains stand clothed to their rounded summits with pines and other forest trees, while grass and brushwood spread a green cloak over the nearer hills, and cultivation covers every available slope.

HAZARD, ROWLAND GIBSON, b. R. I. 1801; a member of the state legislature, but more widely known for his connection with mercantile and manufacturing interests, to which he had added authorship. Among his publications are *Essay on Languages*, *Lectures on the Adaptation of the University to the Cultivation of Mind*, *Lecture on Causes of the Decline of Political and National Morality*, *Causation and Freedom of Willing*, etc.

HAZEN, WILLIAM B., b. Vt. 1830; graduated at West Point 1855; served on the frontier and in the war of the rebellion, being engaged in many skirmishes and battles. He became maj.gen. of volunteers, and after the war was made col. of infantry in the regular army. During the Franco-German war he was employed in studying the education and characteristics of French and German soldiers, and on his return home, wrote a work entitled *School and Army of France and Germany*. In 1877 he was appointed military attaché to the United States legation at Vienna, and in 1880, chief signal officer of the army.

HAZLETON, a t. in Luzerne co., Penn., in the midst of the coal region on the ridge between the Susquehanna and the Delaware rivers, reached by the Lehigh Valley, and by the Danville, Hazleton and Wilkesbarre railroads; pop. of township, 7,500. The coal trade is the chief business, about 1,000,000 tons being mined in this district

every year. In the town are nine churches, a Roman Catholic academy and convent, a town hall, and several manufactories.

HAZLITT, WILLIAM, b. England 1811; son of the essayist; a lawyer and registrar of bankruptcy in London in 1854. He has edited the writings of his father, and made translations of some of the works of Guizot, Thierry, Hue, and others. He has also re-edited *Johnson's Lives of the Poets*, and assisted in compiling a *Manual of Maritime Warfare*.

HAZLITT, WILLIAM CAREW, b. England 1834; grandson of the essayist, and a member of the English bar. He has published *History of the Venetian Republic*, *Sophie Lauria* (a novel), and *Memoirs of William Hazlitt*; and has collected and edited various works on old English poetry, proverbs, antiquities, etc.

HEAD, Sir GEORGE, 1782-1855; b. England. In 1808 he was appointed to the commissariat of the British army in the peninsula, where he was a witness of many exciting scenes and important battles, of which he gave an interesting account in *Memoirs of an Assistant-Commissary General* attached to the second volume of his *Home Tour* published in 1837. In 1814 he was sent to America to take charge of the commissariat in a naval establishment on the Canadian lakes, and he subsequently held appointments at Halifax, and Nova Scotia. Some of his Canadian experiences were narrated by him in *Forest Scenery and Incidents in the wilds of North America*. In 1831 he received the honor of knighthood. He published *A Home Tour through the Manufacturing Districts of England*, and in 1837 a sequel to it entitled, *A Home Tour through various parts of the United Kingdom*. He also published *Rome, a Tour of Many Days*, and several articles in the *Quarterly Review*, and translated *Historical Memoirs of Cardinal Pucci* 1850, and the metamorphoses of Apuleius.

HEADLEY, JOEL TYLER, b. N. Y. 1814; graduated at Union college, studied at the Auburn theological seminary, and was for a time pastor in Stockbridge, Mass. His health failing in 1842-3, he traveled in Europe, and on his return published *Letters from Italy*, and *The Alps and the Rhine*, subsequently he published *Napoleon and his Marshals*, *Sacred Mountains*, *Washington and his Generals*, *Adirondacks, or Life in the Woods*, *The Imperial Guard of Napoleon from Marengo to Waterloo*, *History of the Second War between England and the United States*, *Life of Hancock*, *The Great Rebellion*, *Chaplain and Clergy of the Revolution*, etc. In 1856 he was elected secretary of the state of New York.

HEALTH ASSOCIATION, AMERICAN PUBLIC. On April 18, 1872, an informal conference was held in the city of New York of gentlemen representing five states and five cities, at which a committee was appointed to draw up a constitution for the organization of a national institution for the promotion of sanitary science. The committee made their report at a subsequent meeting held Sept. 12 and 13, at which there were representatives from New York, Pennsylvania, Ohio, Illinois, Louisiana, Connecticut, Rhode Island, and the District of Columbia. A constitution was adopted, and officers elected. This constitution was slightly amended at the next annual meeting held in New York Nov., 1873, and contained among its provisions the following: "The officers shall be a president, a first and second vice-president, a secretary and a treasurer. All the officers shall be elected by ballot annually, except the secretary, who shall be elected for a term of three years." A standing, executive committee consists of "the president, first vice-president, secretary and treasurer, and six members annually elected by ballot." The objects of the association are, to a great extent, served by annual meetings, when various matters of importance relating in various ways to sanitary science are discussed, the various essays and addresses being published in an octavo volume of from four to five hundred pages. For instance, the first volume of reports contains an address by the president "On the Limitations and Modifying Conditions of Human Longevity, the Basis of Sanitary Work." Among the papers read at meetings and published in this volume of reports, which was published in 1875, are "The Relations of Race and Nationality to Mortality in the United States," "Perfection in Structure in the Human Body as a Leading Element of Hygiene," "The General Causes of Disease," "A Report on the Sanitary Care and Utilization of Refuse of Cities," "A Report on Disinfection and Disinfectants," "General Principles Affecting the Organization of Quarantine," "What Can We Do Against Cholera?" There are also various papers on the cholera epidemic in the United States in 1873, and on the yellow fever which prevailed at the same time in different parts of the southern and southwestern states. The report also contains a paper on the "General Health Laws and Local Ordinances, Considered with Reference to State and Local Sanitary Organizations," which discusses in an able manner the following subjects among others: "State Organizations Essential to Local Efficiency," "The Registration of Vital Statistics," "Definition of, and Proceedings Against Nuisances," "Popular Instruction in Physiology and Hygiene." It also gives some account of state boards of health which had been organized up to that time.

HEALTH, METROPOLITAN BOARD OF, of New York. From the year 1800 most of the health laws of New York were intended rather to exclude disease from the city than to prevent its origin. Most of the health laws passed within that period, though

valuable in many respects, were not sufficiently comprehensive. In 1864 the New York Citizens' association, in connection with several physicians, made a sanitary inspection of the city, which resulted in the passage of an act Feb. 26, 1866, creating a "metropolitan sanitary district and board of health therein, for the preservation of life and health, and to prevent the spread of disease." The act provided that four suitable persons, one a resident of Brooklyn, together with the health officer of the port of New York for the time being, shall be sanitary commissioners in and for the sanitary district (the metropolitan police district); and that the said sanitary commissioners, together with the commissioners for any time being of the metropolitan board of police, not exceeding four, shall constitute a board of health for the said sanitary district. The first commissioners appointed held office for one, two, three, and four years, respectively, after which the term of office was to be four years. Provision was made for the appointment of a chief executive officer, to be called the sanitary superintendent, who was required to be a skillful physician. Many powers were conferred on the board and on the executive officer, in abating health nuisances, removing buildings dangerous to life or health, etc. Dr. Elisha Harris was appointed registrar of vital statistics. See HEALTH, MUNICIPAL BOARD OF.

HEALTH, MUNICIPAL BOARDS OF. Institutions organized under city government, and deriving powers from state laws for the purpose of protecting the health of the citizens. The present board of health of the city of New York is a municipal board. From 1866 to 1870 there was a united health department of the cities of New York and Brooklyn, under the title of metropolitan board of health (see HEALTH, METROPOLITAN BOARD OF—NEW YORK). Chapter 137 of the laws of New York, passed April 5, 1870, provides that the city of New York be exempted from the provisions of the act which created the metropolitan board of health, and also created a health department, to consist of the police commissioners of the city of New York, the health officer of the port, and also four officers, to be called "commissioners of health of the city of New York," to be appointed by the mayor for a term of five years—two of whom must have been practicing physicians in the city for a period of five years preceding their appointment. In 1873 an act to reorganize the local government of the city of New York made the following provisions: "The health department shall consist of the president of the board of police, the health officer of the port, and two officers to be called 'commissioners of health,' one of whom shall have been a practicing physician for not less than five years preceding his appointment. The commissioner of health who is not a physician shall be president of the board, and shall be so designated in his appointment. These several officers shall together constitute a board which shall be the head of the health department. The commissioners of health, except those first appointed, shall hold their offices for six years." The act also created two bureaus, the chief officer of one to be called the "sanitary superintendent, who at the time of his appointment shall have been for at least ten years a practicing physician, and for three years a resident of the city of New York, and who shall be the chief executive officer of said department. The chief officer of the second bureau shall be called the register of records, and in said bureau shall be recorded, without fees, every birth, marriage and death, and all inquisitions of coroners which shall occur or be taken within the city of New York." By an amendment to this act, the powers conferred on the metropolitan board of health by the laws of 1866, or any subsequent laws not inconsistent with this act, are conferred upon and vested in the health department and board of health created in its place. The health department, as organized under the act, consisted of the board of health, composed of the four officers above mentioned, viz., the commissioners of health, the health officer of the port, and the president of the board of police, together with a secretary, and the following "officers of the board:" a sanitary superintendent, a register of records, an attorney and counsel, a chief clerk, a consulting sanitary engineer, a consulting pathologist, a consulting meteorologist, a consulting microscopist, a consulting veterinary surgeon, a consulting sanitary architect, nine sanitary inspectors (all of whom were physicians), sixteen assistant sanitary, twelve of whom were physicians. The secretary's department consisted of the secretary of the board, a chief clerk, an auditing clerk, and chief clerk to the secretary, and four other clerks. The attorney's department consisted of the attorney and counsel of the board, and three clerks. The bureau of sanitary inspection consisted of the sanitary superintendent, an assistant sanitary superintendent, a chief clerk to the superintendent, four other clerks, a chief of disinfecting corps, and eight other members of the disinfecting corps. The bureau of vital statistics consisted of the register of records, a deputy register of records, and eleven clerks. By chapter 677, laws of 1872, and by chapter 335, laws of 1873, "the board of police has full and exclusive power and authority, and is charged with the duty of causing all streets, avenues, lanes, alleys, gutters, wharves, piers, and heads of slips to be thoroughly cleaned from time to time, and to be kept at all times thoroughly clean."

Every city of importance in the United States has a municipal board of health. A good example is that of the health department of the city of Boston. At the present time, 1881, the board consists of three citizens, one of whom is a physician, and six "officers of the board," viz.: 1. A superintendent of health, who is not a physician; 2. a city physician; 3. an assistant city physician; 4. a port physician, and 5. a medical

inspector. The seventh annual report of the board of health of Boston for the year ending April 30, 1879, is a model of brevity and conciseness. In regard to street cleaning it says: "The faithfulness and zeal with which the superintendent of health endeavors to keep the streets properly swept and free of nuisances is commendable in the highest degree. As a rule, the streets are in a cleanly condition, and a source of pride rather than a source of offense." The health department of New Haven, Conn., consists of six citizens, one of whom is a physician, a health officer, who is a physician, a quarantine officer, who is a physician, a standing committee of two, one of whom is a physician, and two sanitary inspectors. The report of the health officer for the year 1879 furnishes strong evidence that privy vaults and cesspools are the most frequent generators of typhoid fever and diphtheria to a great extent, because of the prevalent habit of having wells for drinking water in near proximity to them.

HEALTH, NATIONAL BOARD OF, an organization for the promotion of sanitary measures. It was organized under act of congress, Mar. 3, 1879, entitled "An act to prevent the introduction of infectious and contagious diseases into the United States, and to establish a National Board of Health." This provided for the appointment by the president of seven members, not more than one of whom shall be appointed from any one state, to be paid only for time in which they are actually engaged, at the rate of ten dollars a day and reasonable expenses. To these persons there are added one medical officer of the army, one medical officer of the navy, one medical officer of the marine hospital service, and one officer from the department of justice, to be detailed by the secretaries of the several departments and the attorney general respectively, the officers so detailed receiving no compensation. The board chooses its own president and makes its own rules, and also special examinations, as it may deem proper, within the United States or at foreign ports. They are to obtain information upon all matters affecting the public health, and advise the several departments of the government on all matters submitted to them, or whenever they think advice needed. According to the first annual report made to the secretary of the treasury Jan. 1, 1880, the members of the board proceeded to organize April 2, 1879; and since the first meeting the board has met eight times, once at Atlanta, Ga., once at Nashville, Tenn., and on the other occasions at Washington. The report of the board states that these frequent meetings were necessary, because the law did not recognize the existence of an executive committee; nevertheless such executive committee held daily meetings at the national capital, and had charge of the routine business of the board. The board in their report stated that they coincided with opinions expressed in resolutions of the American public health association at a convention held at Nashville, Tenn., in Nov., 1879, and which are "that the quarantine laws of the United States should be under the direction of the National Board of Health, and of an executive committee to be selected by that body." They moreover recommend the assembling of an international health congress. They also recommend the establishment of a quarantine station at the mouth of the Mississippi river, at a place to be designated by the national board. Information was collected in regard to the sanitary condition of some of the principal cities in the United States, and a commission was appointed to investigate yellow fever in the island of Cuba. The commission sailed for Havana July 4, and returned on Oct. 4, 1879. See **YELLOW FEVER**. Various other questions received the attention of the board, such as discases of food-producing animals, the merits of various disinfectants, adulterations in food and drugs, an investigation of the flow of sewers (see **SEWAGE**), a sanitary survey of the eastern coast of New Jersey, bordering on New York harbor, in connection with the state board of health of New Jersey, and a sanitary survey of the city of Memphis, Tenn. See **SANITARY SURVEY**. The report also gives a sketch of the operations of the board under the provisions of the act approved June 2, 1879, to prevent the introduction of contagious or infectious diseases. See **QUARANTINE**. This act states that one of the objects of the organization shall be to co-operate with and aid, as far as it lawfully may, state and municipal boards of health in the execution and enforcement of rules to prevent the introduction of contagious or infectious diseases into the United States. It is also made the duty of the board to obtain information of the sanitary condition of foreign ports and places from which contagious diseases may be imported; and it is provided that the consular officers of ports designated by the board shall make to said board weekly reports of the sanitary condition of the ports and places at which they are respectively stationed. Provision is also made for obtaining reports of the sanitary condition of ports and places within the United States, transmitting the information so obtained to the medical officers of the marine hospital service, to collectors of customs at the ports, and to state and municipal health officers, together with any important information relating to sanitary affairs which they may possess. Five hundred thousand dollars is appropriated, or so much as may be necessary to meet the expenses to be incurred in carrying out the provisions of the act, to be disbursed under the direction of the secretary of the treasury on estimates made by the board, and to be approved by him. It is also provided that the act shall continue in force for a period not longer than four years from the date of approval.

HEALTH, STATE BOARDS OF, institutions established by state legislative enactments, having many specific relations in regard to the public health, but intended to

have a central advisory relation with local sanitary organizations, and also to superintend a state system of vital statistics. There are now in the United States 24 state boards. Massachusetts was the first to organize such a board, which she did in June, 1869, under a law which had been steadily asked for since 1850. California was the next state to organize a board, in 1870; Michigan and Louisiana followed in 1871, and Minnesota and Virginia in 1872; Alabama, Maryland, and Georgia in 1873; Colorado and Wisconsin in 1876; New Jersey and Illinois in 1877, Connecticut, Kentucky, Tennessee, Mississippi, and Rhode Island in 1878; Arkansas, Delaware, North Carolina, and Texas in 1879, and New York and South Carolina in 1880.

The act establishing the state board of health of New York was passed May 18, 1880. It provides for the appointment of "three state commissioners of health, two of whom shall be graduates of legally constituted medical colleges. The said commissioners together with the attorney-general, the superintendent of the state survey, and the health officer of the port of New York, who shall be ex officio members of the state board of health, and three other persons to be designated and appointed by the governor, one of whom shall be a commissioner of health of the board of health of the city of New York, and the others shall be members or commissioners of health of regularly constituted and organized boards of health of cities of the state, shall constitute a board of health of the state of New York." The said three commissioners first named shall hold their office for three years, and whenever a vacancy occurs the place shall be filled as in other cases provided by law. Meetings shall be held at least once in every three months, and as much oftener as shall be deemed necessary. No member of the board except the secretary shall receive any compensation, but the actual traveling and other expenses of the members and officers while on duty shall be allowed and paid out of the appropriation made for its support. They shall elect annually one member of the board to be president, and from their own members or otherwise a person of skilled experience in public health duties to be secretary and executive officer of the board, who shall have all the powers and privileges of a member of the board, except in regard to voting upon matters relating to his own office, to hold office for three years. The state board has the general supervision of the state system of registration of births, marriages, and deaths, and also of prevalent diseases. There are in (1880) the state of New York 333 incorporated villages, each of which under a general statute of 1870 may have a good local board of health. There are besides 939 townships, each of which may organize a local board of health, which shall consist of the supervisor and a majority of the justices of the peace of the township. They are required to appoint a competent physician as health officer, who has the largest powers conferred on him by a state law of 1850, such as power to quarantine places, regulate sources of disease, disinfect, etc. The state board is continually causing sanitary surveys to be made of sickly localities, and these form data for present and future sanitary work.

HEALY, GEORGE PETER ALEXANDER, b. Boston, 1813, portrait painter, studied several years in Paris. His largest picture, "Webster's Reply to Hayne," containing 130 portraits, is in Faneuil hall. In the Paris exhibition (1855) he was awarded a medal for his picture of "Franklin urging the Claims of the American Colonies before Louis XVI." Among many portraits from his pencil are those of Louis Philippe, Marshal Soult, gen. Cass, Calhoun, Webster, Pierce, gen. Sherman, Brownson, Prescott, Longfellow, Guisat, George Peabody, cardinal McCloskey, and William H. Seward. He painted nearly 600 portraits within 20 years.

HEARD, a co. in w. Georgia on the Alabama border, intersected by the Chattahoochee river, 375 sq.m.; pop. 70, 8,769—3,095 colored. It is hilly, and largely covered with forests; soil fertile; chief products: cotton, wheat, corn, etc. Co. seat, Franklin.

HEARD'S ISLAND, in the s. Indian ocean, 280 m. s.e. of Kerguelen Land, in about 53° s. and 73° east. It measures about 30 by 10 m., and has a peak 6,000 ft. above sea level.

HEARSE. See HEARSE, *ante*.

HEARTS CONTENT, a port of Newfoundland on Trinity bay, 47° 50' n. and 53° 20' w. It is an excellent harbor, and the surrounding scenery is fine. The Atlantic telegraph cables land here.

HEAT, (*ante*). The history of thermotics, the science of heat, from the earliest speculations to the most recent investigations, is full of interest. The ancients held notions in regard to it, which, although they lacked the precision which attends modern scientific investigation, were remarkable examples of the power of human reason to advance in the direction of truth unaided by anything except the inward light vouchsafed by the Creator. The medium of light and heat radiation, the cosmic or interstellar ether, which within the last century has been demonstrated to have an existence, was believed in by many of them. It was often the divine personification of cosmic material and also of force. In the Orphic hymns Æther is the soul of the universe and the author of all life. Anaxagoras, who taught that the sun was an inanimate fiery mass and not a deity, considered Æther to be the principle of fire or heat, and a half a century later Democritus, born about 460 B.C., taught that heat was produced by

the efflux of extremely minute particles of matter, and moving with such velocity as to penetrate solid bodies; that some of these particles were infinitely small and from them the soul was formed. Plato had similar ideas, which may be found in his writings. Aristotle believed heat to be a condition of matter, and not a material substance, and his ideas were probably the first suggestions of a purely mechanical theory of heat. Twenty centuries later, Francis Bacon, 1561-1626, said in his *Novum Organum*, "Heat is a motion of expansion, not uniformly of the body together, but in the smaller parts of it; and at the same time checked, repelled, and beaten back, so that the body acquires a motion alternate, perpetually quivering, striving and struggling, and irritated by repercussion, whence springs the fury and fire of heat." Three-quarters of a century later, John Locke made a statement which approached still nearer the modern ideas on the subject. He says: "Heat is a very brisk agitation of the insensible parts of an object which produces in us that sensation from whence we denominate the object hot; so that what in our sensation is heat, in the object is nothing but motion." About the same time, Huygens, in his *Tractatus de Lumine*, brought forward the undulatory theory of light, which contains many passages approaching much nearer than anything previously written, or for a century afterwards, to what may be called a scientific exposition of the laws of heat and light. He says: "It appears that light when gathered in the focus of a concave mirror, has the property of burning like fire, that is to say, it dissociates the particles of bodies, and this most certainly indicates motion, at least according to that philosophy wherein the causes of all natural effects are conceived by means of mechanical reasons." As a general statement of the doctrines of heat as a mode of motion this has not been put in much better words since his time. The doctrine of the actual convertibility of heat into mechanical force, which should stand as an equivalent, cannot be said to have been fairly started previous to the experiments of the American count Rumford. When at Munich superintending the manufacture of ordnance for the Bavarian government his mind was impressed with the great production of heat in boring cannon. By the use of a borer $\frac{5}{8}$ of an inch in diameter, applied with a pressure of 10,000 lbs. and a velocity of 32 revolutions per minute, sufficient heat was produced to raise 18 lbs. of water from 60° to 212° F. in two hours and a half. The capacity of heat in the turnings having not changed, he concluded that the heat, whose source seemed to be inexhaustible, was the result of motion. Quantitative determinations, however, were necessary to demonstrate the correlations of heat and mechanical force, or heat and motion. These were furnished by the experiments of Dr. J. P. Joule of Manchester, England, and by Dr. J. R. Mayer of Hielbronn, Germany, which established what has been called the *mechanical equivalent of heat*. Joule's experiments were made in various ways. In one he employed paddle-wheels, which were made to revolve with a measured power in various liquids, whose specific heats being known, the mechanical force could be compared with the amount of heat generated. Disks of metal were also revolved and forced against each other, the result in the evolution of heat being the same in all cases. He established the law which goes by the name of *Joule's equivalent*, or the *dynamical unit of heat*, viz.: that the fall of 772 lbs. through the space of one vertical foot affords a force sufficient to raise the temperature of water 1° F. In other words, the force given by the fall of 772 lbs. through one foot is equal to that generated by the elevation of 1 lb. of water 1° F. Dr. J. R. Mayer arrived at the same conclusions a year or two earlier by investigating the effects of the expansion and compression of gases, (see *Mechanical Equivalent of Heat in Correlation and Conservation of Forces*, N. Y., 1876. *BOILING OF LIQUIDS, DIATHERMANCY, FORCE, RUMFORD.*) (*ante*).

HEATH, WILLIAM, 1737-1814; b. Mass. He commenced life as a farmer, but being fond of militia exercises he entered the ancient and honorable artillery company, occupying the position of chief officer in 1770. He was a representative in the provincial congress in 1774-75, and in 1776 was made a maj.gen. After the battle of Lexington he rendered good service in the pursuit of the British forces and in organizing the undisciplined men around Boston. He was in New York in 1776, and was one of the few officers who were opposed to evacuating the city. He continued in active and important service until the close of the war, when he went back to his farm. Afterwards he was state senator, probate judge, and was elected but declined the office of lieutenant-governor. His memoirs, written by himself, were published in 1798.

HEATHFIELD, Lord. See **ELLIOTT, GEORGE AUGUSTUS.**

HEATING. See **WARMING and VENTILATION.**

HEBEL, JOHANN PETER, 1760-1826; b. Germany; studied at Erlangen, and in 1791 was professor in the gymnasium at Carlsruhe. In 1805 he was a church counselor, and in 1819 a prelate. He wrote many poems in the Swabian dialect which became so popular that he was called "the Burns of Germany."

HEBERDEN, WILLIAM, 1710-1801; an English physician. In 1724 he was sent to St. John's college, Cambridge, where he obtained a fellowship about 1730, became master of arts in 1732, and took his degree in physic in 1739. He remained at Cambridge about ten years longer as a practitioner of physic, and gave an annual course of lectures on materia medica. In 1746 he became a fellow of the royal college of physicians in London; and afterwards establishing himself in London, was elected fellow of the royal

society in 1769, and was employed in extensive practice for 30 years. In 1778 he was made an honorary member of the royal society of medicine at Paris.

HEBRUS. See MARITZA, *ante*.

HECK, BARBARA, 1734-1804; b. Ireland, of German parents, in a district which early felt the influence of Wesley's preaching. She and her husband Paul came to America with Philip Embury in 1760, and in 1766 they organized a Methodist society in Embury's house in New York city. This led to the famous old John street Methodist chapel. With Embury she was instrumental in founding other societies in northern New York and Canada.

HECKER, ISAAC THOMAS, b. N. Y., 1819. About 1843 he became interested in socialistic communities at Brook farm and at Fruitlands, Mass. In 1845 he joined the Roman Catholic church, and in 1849 (in England) was ordained a priest. He joined the Redemptorists, but with others was released from his vows, and founded the congregation of St. Paul the apostle, or Paulists. In 1865 he established in New York *The Catholic World*. He was present, as procurator of bishop Rosecrans, at the Vatican council in 1869, and in 1873 traveled extensively in Europe and the east. He is the author of *Questions of the Soul*, and *Aspirations of Nature*.

HECKEWELDER, JOLN, 1743-1823; b. England, accompanied his parents at 12 years of age to Pennsylvania, and in 1771 became a Moravian missionary among the Indian tribes along the Ohio. After laboring 40 years he retired and passed the remainder of his life at the Moravian village of Bethlehem, Penn. He wrote a valuable *History of the Manners and Customs of the Indian Nations*, and a narrative of his missionary work.

HECTOGRAM. See METRIC SYSTEM.

HECTOLITER. See METRIC SYSTEM.

HECTOMETER. See METRIC SYSTEM.

HEDDING, ELIJAH, D.D., 1780-1852; b. N. Y. At the age of 18 he joined the Methodist church and begun work as an itinerant preacher in Vermont and Canada. In 1803 he was sent to New Hampshire, and in 1807-9 was presiding elder of the New Hampshire and New London districts. From 1809 to 1824 he preached chiefly in Massachusetts. In the latter year he was chosen bishop, and in 1848 represented the church in the British conference. He was one of the founders of *Zion's Herald*, the first Methodist paper in the country. His *Manual of Discipline* is highly valued.

HEDGE, FREDERICK HENRY, D.D., b. Mass., 1805; son of Levi, the professor of logic and metaphysics in Harvard college. In 1818 he accompanied George Bancroft to Germany, where he studied nearly five years. He returned in 1823, and two years later graduated at Harvard. The next three years were passed in the study of theology, and in 1828 he was settled in the Unitarian ministry at West Cambridge. Afterwards, he was pastor at Bangor, Me.; Providence, R.I.; and Brookline, Mass. He traveled in Europe in 1847-48. In 1857 he was made professor of ecclesiastical history in the Cambridge theological school. In the same year he edited the *Christian Examiner*, a Unitarian journal, and in 1859 was president of the American Unitarian association. In 1872 he was appointed professor of German in Harvard college, where he now remains. He has published *The Prose Writers of Germany*; *Liturgy for the use of the Church*; *Reason in Religion*; *Primæval World of Hebrew Tradition*; and many translations from German poets.

HEFELE, KARL JOSEPH VON, D.D., b. Würtemberg 1809; graduated at Tübingen, and in 1840 received a professorship in the Catholic theological faculty, where he represented the departments of church history, Christian archaeology, and patrology. In 1838 he became doctor of divinity, and afterwards knight of the order of the Würtemberg crown. From 1842 to 1845 he was a member of the Würtemberg chamber of deputies. He was consecrated bishop of Rottenberg in 1869, and took part in the Vatican council. In 1874 he declined the archbishopric of Freiburg offered to him by the Baden government on the ground that he could not take the oath which was demanded from the bishops in Prussia and Baden. His most important work of research is the *History of Councils*, based on the study of original materials. It has been translated into English under the title of *A History of the Christian Councils, from the Original Documents, to the close of the Council of Nicæa, A.D. 325*. Among other works are *The Introduction of Christianity into South-Western Germany*, *Cardinal Ximenes and the Ecclesiastical Condition of Spain in the Fifteenth Century*, and *Contributions to Church History, Archaeology, and Liturgy*. He has also published a *Selection of the Homilies of Chrysostom* in a German translation, and an edition of the works of the apostolic fathers. An English translation by the Rev. Canon Dalton, of his *Life of Ximenes*, appeared in 1860.

HEIBERG, JOHANN LUDVIG, 1791-1860; a Danish critic and poet, son of Peter Andrea Heiberg, the political writer, and of the famous novelist afterwards the baroness Gyldenbourg-Ehrens-värd. Johann was educated at the university of Copenhagen. In 1812 he visited Sweden and made some stay in Stockholm. In 1813 his first publication appeared, a romantic drama for children, entitled *The Theater for Marionettes*. This

was followed by *Christmas Jokes and New Year's Tricks*, *The Imitation of Psyche*, and *The Prophecy of Tycho Brahe*. These works were looked upon as the opening of a great career. In 1817 Heiberg took his degree, and in 1819 went abroad with a grant from government. In 1822 he published his drama of *Nina*, and was made professor of the Danish language at the university of Kiel, where he delivered a course of lectures, comparing the Scandinavian mythology as found in the *Edda* with the poems of Oehlenschläger. In 1825 he went to Copenhagen for the purpose of introducing the vaudeville on the Danish stage. In 1828 he brought out the national drama of *Eleverhøi*; in 1835 the comedy of *The Elces*, and in 1838 *Fata Morgana*. In 1841 he published a volume of *New Poems*, containing *A Soul after Death*, perhaps his masterpiece, and other pieces. He founded the *Copenhagen Flying Post* in 1827, and continued until 1837. In 1831 he married Johanne Louise Pætges, the greatest actress that Scandinavia has produced. His scathing satire at last begun to make him unpopular; and this antagonism reached its height when in 1845, he published his little malicious drama of *The Nut Cracker*. He received, however, in 1847 the responsible post of director of the national theater. He filled it for seven years, but resigned in 1854.

HEIDENHEIM, a t. in Württemberg, on the Stuttgart and Nordlingen railroad, 46 m. e.s.e. of Stuttgart; pop. 5,677. There are manufactures of cotton, paper, woollens, etc., and a large trade in cattle and grain.

HEIMDALL, or HEIMDALER, in Norse mythology, a son of Odin, whose mother was of the Totun race, often said to be the son of the nine virgin sisters. He is called "Goldtooth," his teeth being of that metal; and the "owner of the vaulted arch" (rainbow), and dwells in Himminhjörg, the mountains of heaven at the end of the rainbow. He is the warder of the gods, and keeps watch that the giants do not cross over the rainbow bridge. He sees by day or night, a hundred miles around him; he hears the growing of the grass, and of the wool on a sheep's back. He figures at the death of Badur, and will appear at Ragnarök (the last day), and blow his horn, which will be heard throughout the universe, and will be the signal for the final dissolution.

HEIMR (Icelandic, *home*, or *abode*); in Norse mythology nine worlds are named: Muspelheim, Asaheim, Ljosalfheim, Vanaheim, Mannaheim, Jötunheim, Svartalfheim, Helheim, and Niflheim. The highest is Muspelheim (world of fire), the home of Surt, in the highest region of which Gimle (heaven) was seated. The lowest is Niflheim (mist-world), the home of cold and darkness, having in its midst the fountain Hvergelmer, where the dragon Nidhogg dwells. Midway between Muspelheim and Niflheim is Mannaheim (man's world), the round plane of the earth surrounded by the ocean. The gods gave Midgard to the first human pair as a home for their descendants. Far above Mannaheim is Asaheim (world of the gods), forming an immense vault above the earth. In the midst of this is Idavold, the place where the gods assemble, containing Odin's throne Hlidskjalf. Beyond the ocean is Jötunheim (home of giants), separated from Asaheim by the river Iting, which never freezes over. Next above the earth is Ljosalfheim (home of the elves of light), and between it and Asaheim is Vanaheim (home of the vans). Further down is Svartalfheim (world of dark elves); further still Mannaheim, and lastly Helheim (world of the dead, or *hell*), doubtless the original of the English "hell."

HEINECKEN, CHRISTIAN HEINRICH, 1721-25; a child of extraordinary precocity; b. at Lubeck, where his father was a painter. Able to speak at the age of ten months, by the time he was one year old he knew by heart the principal incidents in the Pentateuch. At two years he had mastered the sacred history; at three was acquainted with history and geography, ancient and modern, sacred and profane; besides being able to speak Latin and French; and in his fourth year he devoted himself to the study of religion and church history. He was able to reason on and discuss the knowledge he had acquired. Crowds of people flocked to Lubeck to see the wonderful child; and in 1724 he was taken to Copenhagen at the desire of the king of Denmark. On his return to Lubeck he began to learn writing, but his sickly constitution gave way and he died in his fourth year.

HEINSIUS, ANTONIUS, 1641-1720; grand pensionary of Holland, confidential friend and agent of William of Orange. After the latter became king of England he left the affairs of Holland in the hands of Heinsius, who brought about the participation of Holland in the grand alliance concerning the Spanish succession with England, Prussia, Denmark, Savoy, and Hanover. He stoutly opposed the efforts of Louis XIV. to open negotiations with the allies for peace, and when it was at last effected he was the last to sign the treaty.

HEINSIUS, DANIEL, 1580-1655; a famous Dutch scholar. In 1594, being already remarkable for his attainments, he was sent to the university of Franeker to perfect himself in Greek under Henricus Scotomus. He stayed at Franeker half a year, and then settled at Leyden for the remaining sixty years of his life. There he studied under Joseph Scaliger, and there he became the friend and associate of Marnix de St. Aldegonde, Janus Douza, and Paulus Merula. His proficiency in the classic languages won the praise of all the best scholars in Europe, and offers were vainly made to him to accept honorable positions outside of Holland. He soon rose in dignity at the university of

Leyden. In 1602 he was made professor of Latin in the university of Leyden, in 1605 professor of Greek, and at the death of Merula, in 1607, he succeeded that illustrious scholar as librarian. The Dutch poetry of Heinsius is of the school of Roemer Visser, but attains no very high excellence. It was, however, greatly admired by Martin Opitz, who was the pupil of Heinsius, and who, in translating the poetry of the latter, introduced the German public to the use of the rhyming Alexandrine.

HEINTZELMAN, SAMUEL P., 1805-80; b. Penn.; graduated at West Point, served on the northern frontier in the Florida war and in the war with Mexico, and later in California and on the Texas frontier chiefly against the Indians. In 1861 he was made col., and assigned to duty in Washington. The same year he was appointed brig.gen. of volunteers and commanded at Alexandria, Va. He was wounded in the first battle of Bull Run. In 1862 he commanded the army corps before Yorktown, and was engaged in the battle of Williamsburg. Promoted to maj.gen., he was in the Fair Oaks and the seven days' conflict, and in the second Bull Run battle, as well as at Chantilly. He commanded the defenses at Washington, and in 1864 assumed the command of the northern department, Ohio, Michigan, Indiana, and Illinois, and in the autumn of 1865 was mustered out of the volunteer service. Early in 1869 he was retired from duty, with the rank of maj.gen. in the regular army.

HEIR (*ante*), at common law, one who is born or begotten in lawful wedlock, and upon whom the law devolves an estate immediately upon the ancestor's death. No one is the heir of a living person, but one may be the heir apparent or presumptive. Neither a monster nor a bastard can be an heir. In civil law any one who succeeds to the rights and occupies the place of a deceased person is an heir. An *heir apparent* is one who has an absolute right to an inheritance if outliving the possessor. *Beneficiary heirs* accept succession under the benefit of an inventory, the main purpose of which is to limit liability for debts. A *collateral heir* is one not in direct line, as a brother, uncle, aunt, nephew, or niece. A *conventional heir* takes succession by virtue of a contract, as by marriage contract. A *forced heir* is one who cannot be disinherited. Any heir at common law is a general heir. Irregular heirs are (in Louisiana) those who are neither testamentary nor legal, but are established for the succession by law. The civil code of that state provides that when the deceased has left neither lawful descendants nor ascendants nor collateral relations, the law calls to the inheritor a surviving husband or wife, or his or her natural children, or the state *heirs at law* are the same as heirs general, those who stand in natural succession. *Legal heirs* are persons of the same blood as the deceased who take succession by force of law, thus differing from a testamentary heir who succeeds by the act of the deceased. Three classes of legal heirs are recognized; the children and other lawful descendants; the fathers and mothers and other lawful descendants; and the collateral kindred. An *heir presumptive* is one who may be the legal heir, but whose right may be destroyed by a later born child. A *testamentary heir* succeeds under a regularly made will. *Unconditional heirs* inherit without reservation.

HEL, in Norse mythology, a goddess or giantess who dwells in Niflheim under the roots of Yggdrasil, and rules over nine worlds. Her residence is called Helheim, and the Hel-way thither is long. Its course is northward and downward; gloomy rivers surround her world, one of which flows through valleys filled with swords. A dog stands outside of a cave, and with loud howling greeted Odin when he rode down to Hel to wake the prophetess in her grave-mound e. of the Hel-gate to inquire the fate of Balder. Hel binds the dying with chains that cannot be broken. She receives all who die of sickness or old age. Her company is large, but her shadowy realm has room for all. The worst go into Niflheim; or the ninth and lowest world, into the place named Angnial, the threshold of which is Precipice, their table is Famine, their waiters Slowness and Delay, and their bed is Care. Hel rides a horse with only three feet. Faith in this goddess is not yet extinct. Hel-shoes (hell-shoon) are still put on the feet of the dead, and her dog is heard barking to give warning that death is at hand. In Norway when any one recovers from dangerous illness he is said to have given Hel a bushel of oats, in allusion to the belief that she wanders around in the form of a horse. That the English noun "hell" is derived from the name of this goddess seems beyond doubt.

HELAMYS, *Pedetes capensis*, the Jerboa or jumping hare; a rodent of s. Africa, of the family *pedetidae*. Its length is 12 to 15 inches; it occasionally jumps over 30 feet. It is exceedingly timid, and its habits are nocturnal.

HELENA, a t. in Phillips co., Ark., on the Mississippi, 75 m. below Memphis, at the e. terminus of the Arkansas central railroad; pop. 5,000. It has 9 churches, 2 newspapers, oil mills, and some manufactories, but its main business is in cotton, of which 40,000 to 50,000 bales are shipped yearly.

HELENA, the capital of Montana, in Lewis and Clarke co., 14 m. w. of the Missouri, and near the Rocky mountains; pop. 10,000. Rich gold mines were found in its vicinity about 1864, and since then the city has grown rapidly. It has a court-house, banks, a land office; quartz crushing, flour, and lumber mills; daily and weekly news-

papers, a hospital, a Roman Catholic academy and convent, and the public offices of the territory.

HELIAND, a Saxon poem of the 9th century. The portion yet preserved sets forth the life of Christ as told by the four evangelists, whose various narratives the author seeks to harmonize. It is thought to have been composed by a Saxon writer of unknown name at the request of the emperor Louis the pious. Like all the most ancient remains of Teutonic poetry, *Heliand* is written in alliterative verse, of which the writer was perfect master. It is almost the only remnant of the old Saxon dialect, and has therefore a high philological value, but it is still more interesting from a literary point of view. The poet does not merely repeat his authorities; while true to the main facts of the original story, he allows his imagination to play upon them in a free and poetic spirit. He realizes intensely the incidents in the career of the Founder of Christianity, and imparts vitality and definiteness to the received conception of His character. The diction is simple and popular, but marked by an elevation of sentiment adapted to the theme, and the author often succeeds most happily in imparting to his style color, variety, and animation. The 9th c. is remarkable in the history of old English and old Norse poetry; the *Heliand* affords proof of that same impulse which operated also upon the higher minds of Germany. The historical aspects of this great work are hardly less important. Of all the German tribes the Saxons were the last to submit to the influence of Christianity. They regarded baptism as the symbol of Frankish supremacy, and clung tenaciously to the ancient Teutonic faith. It was only when Charlemagne, after more than 30 years of warfare, forced the new creed upon them that it gained acceptance by them, and then when they talked of Christ and the saints, they associated them with Woden and Thor, and took delight in the heathen poetry which had been handed down from remote periods.

HELIOGRAPHY (*sun telegraphy*), a name given to a method of communicating between distant stations by reflections of the sun upon a mirror or system of mirrors. One great advantage of this method over the ordinary signal system is that the apparatus is more portable, but it can be successfully used only in regions where the atmosphere is clear of clouds through considerable periods of time. Anybody who has any idea of the ordinary method of telegraphing by electricity with the ear alphabet, will understand how spaces of time may be employed to indicate letters and words by means of the eye. There are two methods: the reflector may be obscured except when the screen is temporarily removed to produce a flash or letter; or the reflector may be kept exposed except when it is obscured to produce a letter. The first method is said to be the easier for the beginner, but the second less fatiguing to the eye. The distance through which this mode of communication may be carried on varies with the size of the mirrors and the clearness of the atmosphere. From the Himalayas a 5 in. mirror has communicated distinct signals 60 miles. The instrument could be used with good success on the Andes. When the signaling station forms an angle greater than a right angle between the sun and the receiving station, two mirrors are used to prevent too great a loss of rays by oblique reflection. The mirrors are mounted on tripods, and are held by a socket, or a universal joint. Besides its use as a signaling instrument, the heliograph has served to define distant points in a survey, and for this purpose was employed in the triangulation of India. It was also used by the late astronomer-royal of England at the cape of Good Hope in verifying the arc of the meridian.

HELIX, in architecture, a spiral form, as when a flight of steps winds round a cylindrical space or center post. The name is also given to the little volutes under the flowers of the Corinthian capital.

HELL, MAXIMILIAN, 1720-92; b. Hungary; a Jesuit and an astronomer. While in Vienna he studied at the observatory, and at a later period was professor of mathematics in the university of Klausenburg, and afterwards director of the Vienna observatory until his death. He was the author of two works on astronomy.

HELLADOTHERIIDÆ (Gr. "Greek wild beast"), a family of mammals which has been established for an extinct animal found in the miocene formation near Athens. It resembled the giraffe in its high shoulders and neck, which latter, however, was shorter than the giraffe's; and also the antelope in the proportion of its limbs. It was of very great size. The molar teeth were broad, and the plates of enamel on their grinding surfaces were simple curves. The skull shows no signs of having been horned. Generic name, *Helladotherium*.

HELLANICUS, a Greek logographer, or reporter, b. Mytilene, in the 5th c. b. c. As a historian he was greatly in advance of preceding logographers. Not content with repeating the traditions that had gained general acceptance through the poets, he tried to produce them as they were locally current, and availed himself of the few national or priestly registers that presented something like contemporary registration. Thus, in the first place, he gave in many points accounts quite different from the usual beliefs, e. g., he recorded the local belief in the troad that Troy had not been wholly destroyed by the Greeks, but had continued to exist to his own time; and in the *Atthis*, touching on Spartan affairs, he made no reference to Lyncurgus, but attributed the Spartan constitution to Eurysthenes and Procles. Now, it is certain that the Spartan state registers

could not have made any mention of Lyeurgus on account of the plan on which they were framed. Secondly, Hellenicus laid the foundations of a scientific chronology, though his materials were insufficient, and he often had recourse to the usual rough reckoning by generations. On account of his deviations from common tradition, Hellenicus is often called an untrustworthy writer by the ancients themselves, but probably few authors would have been more useful to a scientific student if his works had been preserved.

HELLE, in Greek mythology, a daughter of Athamas, king of Thebes in Bœotia, and the goddess Nephele whom he had married at the command of Hera. The king was secretly in love with Ino, a mortal, and married her. The family dissensions soon became so violent that he consulted a Delphic oracle, where the priestess (bribed by Ino) told him that he must sacrifice Prixus, the brother of Helle. To save her children Nephele dispatched them to Colchis on the back of the ram with the golden fleece; but while crossing a strait Helle fell off and was drowned. The strait was named the Hellespont or sea of Helle.

HELLEN, in Greek tradition the son of Deucalion and Pyrrha, the survivors of the deluge. Hellen had three sons, Dorus, Æolus, and Xuthus; and from Dorus, Æolus, and two sons of Xuthus, the four great branches of the Greek people; while the Greeks collectively are called Hellenes after Hellen.

HELLER, STEPHAN, b. Hungary, 1814; German composer; studied in Vienna, and in 1829 made a professional tour in Germany. Since 1838 he has been in Paris. His works are chiefly for the pianoforte, and some critics rank him in this respect above Chopin. He has published more than 150 works.

HELL GATE (*ante*) IMPROVEMENTS. Hell Gate may be more particularly described as that part of the East river between Long island and Manhattan island, also between Long island and Ward's island, and between Ward's island and Manhattan island. (Little Hell Gate is an unimportant small passage between Ward's island and Randall's, lying to the n. and having a transverse direction). The reefs of rock in the main passage, some of which were islands at low tide, caused with the rising and falling of the tide numerous whirlpools and eddies, which rendered navigation at times really dangerous, always difficult; and for large ships impossible, although the depth in the tortuous channel might be sufficient.

A survey was made as long ago as 1848 by (then) lieutenant-commanding Charles H. Davis and David Porter, of the U. S. navy, and in their reports they recommended the destruction by blasting of Pot rock, Frying pan, and Way's reef, which lie between Long island and Ward's island. Lieut. Davis proposed also to clear the middle channel, between Long island and Manhattan or New York island, and immediately below Ward's island, which contains Little Mill rock, Great Mill rock, Middle reef, Heel Tap rock, and others; but lieut. Porter advised rather the destruction of a part of Hallett's point, which, in connection with Ward's island, turns the current in the east channel toward Manhattan island, forcing it against the current of the w. channel at right angles. The destruction of the whole of Hallett's point would allow the two currents to meet at a very small angle, but such an operation, it was thought, would require altogether a greater outlay than would be practicable, and the advantages would be slight, because the usefulness of both shores of the river requires the removal of the middle obstructions.

The science of submarine blasting as now understood, had no existence at that time. Where the currents in a stream allowed of the operation, diving-bells were often used as a means of drilling and blasting, but the fierce currents of Hell Gate precluded this method. Physics had taught that the inertia of liquids and even gases could be made available as a reacting force, in mechanical operations, if the primary force or impulse were approximately instantaneous; indeed, ordinary mathematical reasoning leads to this conclusion. The idea of using superjacent water as a "tamping" by simply igniting the explosive upon the surface of the rock was first successfully put into practice by M. Maillefert, with whom a contract was made to remove obstructions in Hell Gate, the money, \$14,000, being raised by citizens of New York. He commenced work in Aug., 1851, by a process which consisted in letting down a can of gunpowder on the surface of the rock and exploding it by means of the galvanic current. The can, as a rule, contained about 125 lbs. of gunpowder. He operated upon Pot rock, Frying pan, Way's reef, Shelldrake, Bald-headed Billy, Hoyt's rocks, Diamond reef, and Hallett's point reef. Upon the latter, however, he produced no sensible effect. He reduced the most prominent surfaces of these rocks to an average depth of about 16 ft.; some to 18 ft. depth; one, Way's reef, only to 14. These rocks were originally from 5 to 15 ft. below lowwater mark. He fired in all 620 charges, 284 being upon Pot rock. Bald-headed Billy was blown into deep water with one charge. Six charges, having an aggregate of 750 pounds of powder, and a cost of only \$509, deepened Shelldrake from 8 to 16 feet. Other rocks gave more trouble, the deepening of Pot rock from 8 to 18.3 ft. requiring over 34,000 pounds of powder, and costing \$6,837.

Congress, in 1851, appropriated to the work \$20,000, and of this \$18,000 went toward lowering Pot rock to a depth of 20 ft., under the direction of maj. Fraser; the great cost of lowering only two additional feet being in consequence of the considerable increase

of surface, and the smoother condition of it. The method was by surface blasting as has been practiced by M. Maillefert. In 1856 it was recommended by the advisory council to the commissioners to further deepen the rocks in Hell Gate, and by the method not of surface blasting, but of drilling. Their statement that this could be easily effected is somewhat remarkable when it is considered that no method of drilling had up to this time been employed, except by use of the diving-bell, impracticable in Hell Gate. Nothing, however, was done until 1866, when brevet maj. gen. John Newton of the U. S. engineers, was ordered to make a survey, the report of which he made to congress in 1867. He proposed the construction of a drilling scow which should be securely moored at the site of operations. A dome made of strong boiler iron, of a hemispherical shape, 30 ft. in diameter, served as a framework for 30 drill tubes. This dome rested upon self-adjustable legs, and was let down to the surface of the rock from amidships of the scow. The self-adjustable legs allowed it to settle in a firm and unmovable position, as regarded the action of the current. The machine was not commenced till July, 1869, owing to want of funds. It was constructed, and put into operation on Diamond reef, near the mouth of the East river, in May, 1871. Coenties reef was also operated on with this scow in alternation with the work on Diamond reef. These operations proving satisfactory, the machine was taken to Hell Gate, and 17 holes were drilled into Frying pan rock in July, 1872. Also 11 surface blasts were made. In Aug. of the same year the scow was put to work on Pot rock, where it remained until the close of the year. During this time there happened some sixteen collisions with passing vessels, which caused much delay, so that it was deemed proper to surrender the work until more efficient regulations could be had in regard to pilots. However, during the five months' work on Pot rock, 40 holes were drilled and blasted, and 60 seam blasts and 24 surface blasts were made. The débris had to be removed by divers during slack water. On account of the rapidity of the current at any other time, Way's reef, which had been reduced to a depth of 14 ft. in 1857, and again in 1869 to $17\frac{1}{2}$ ft. by surface blasting, was attacked by the drilling scow in Aug., 1874, and by the end of Jan., 1875, it was reduced to a depth of 26 ft., at mean low water. This rock was 235 ft. long by a maximum width 115 feet. There were 262 holes drilled, having an aggregate depth of 2,130, or an average of a little more than 8 ft. for each hole. The explosives used were over 15,000 pounds of nitro-glycerine for drill blasts and about 1500 pounds for surface blasts; also, 38 pounds of dynamite.

Of the operations which have been completed, those upon Hallett's point reef are by far the most extensive. Hallett's point, the site of fort Stevens, is a considerable peninsula, projecting into the East river immediately above Astoria. The reef, which was dangerous to vessels, ran along the shore about 720 ft., and projected about 300 ft. into the river. This immense mass of rock was removed by tunneling, a process first proposed by Mr. G. C. Reitheimer, and soon after by gen. Alexander of the U. S. engineers, and Mr. A. W. Von Schmidt, C.E., to whom was given the contract for removing Blossom rock in San Francisco harbor, the first operation of the kind ever performed. See SAN FRANCISCO. Blossom rock was, however, of less size than Way's reef, being only 180 by 100 ft. in area, while the latter was 235 by 195 at its greatest breadth. This, as described above, was removed partly by surface blasting, and partly by surface drilling, but at less cost than for removal. For the removal of the reef at Hallett's point, a coffer dam in the form of an irregular pentagon of 140 ft. greatest diameter was erected on the shore, and in this there was sunk a shaft having a diameter of 165 by 95 ft., and a depth of 33 ft. below mean low water. From this shaft diverging tunnels were excavated in the rock, which is a tough gneiss, with nearly a perpendicular dip (the character of all the rock in Hell Gate). As these tunnels extended they were connected by transverse galleries, and afterwards new diverging tunnels, commencing in the galleries were commenced and extended. There were eight concentric galleries, with the addition of two additional partial ones at the periphery, the whole number of tunnels being 25. The mouths of the tunnels were from 17 to 22 ft. high and 12 to 9 ft. wide, but diminishing quite rapidly to keep under the floor of the river. The galleries, which were about 25 ft. from center to center, also varied in height for the same reason. The lineal measure of the tunnels and galleries was 7,425 ft., and the whole area embraced was $2\frac{1}{2}$ acres. The ordinary processes now in use for tunneling or excavating rock were employed. See TUNNEL. The mass of rock included in the scope of operation is said to have been something over 110,000 cubic yards; the number of cubic yards of rock removed from the tunnels and galleries being computed to be 47,461 cubic yards. After the excavation was completed, holes were drilled into the piers, which were left standing between the tunnels and galleries, supporting the roof, and also into the roof, and charged with nitro-glycerine held in cans into which the electrodes of a galvanic battery were introduced. Water was let into the mine by a siphon into the shaft the day previous to the explosion, which took place on Sunday, Sept. 24, 1876. It is proper here to state, that the blasting was done on this day, notwithstanding there were protests, because of a delay in the delivery of the explosives, and the charging having been completed, gen. Newton was unwilling to endanger the lives of his men by delay. The time of the explosion was 2 h. 57 m. P.M., at high tide. It lasted about three seconds, the vibration of the earth being slight, but perceptible to a considerable distance. No damage was done to property. The nitro-glycerine used was contained in the following compounds: Dyna-

mite, 28,901 pounds; rend-rock powder, 9,061; vulcan powder, 14,244; making a total of 52,206 pounds, or more than 25 tons. This was contained in 13,596 cartridges. The number of charged holes was 4,427; they were from two to three inches in diameter, with an average depth of 9 ft., and averaged about 8 ft. apart. They were all connected by about 100,000 ft. of wire, and the blasts were exploded by 64 batteries having an aggregate of 960 cells. Three cartridges were usually placed in a cell, with a priming of dynamite which was exploded by the percussion of fulminate of mercury, connected with the voltaic arc. The success may be said to have been perfect. The blasting at first, or before 1874, was principally with pure nitro-glycerine. Afterwards "mica powder," "giant powder," "rend-rock," and "vulcan powder," were used, and although having less power, were found more effective and economical. The amount appropriated by congress between 1868 and 1876 was \$1,940,000, of which nearly \$1,717,000 was expended upon the operations at Hallett's point.

HELLMUTH, ISAAC, D.D., was by birth a Pole and belonged to a Jewish family. Becoming a convert, he entered the Anglican ministry and proceeding to Canada entered upon the duties of his profession. He founded Huron college in 1863, and six years later, at London, Ont., the college and ladies' seminary which bear his name. In 1871 he succeeded to the bishopric of Huron.

HELODERMIDÆ (Gr. *helos*, a nail, and *derma*, skin—nail-skinned), a family of saurians of the group *diptyglossæ*, differing from other members of the group by having scales resembling nails over a great portion of the skin; temporal fossæ overarched by skin ossification. They have no premaxillary foramen, and the teeth have short, dilated bases, ankylosed obliquely; mesosternum longitudinal, without lateral limbs; color, dark, almost black; reticulated spaces between the scales, yellow. It has the name of *scorpion* in southern Arizona. The family was established by Gray and Cope, 1864-66.

HELOS, in ancient geography the name of several towns, so called because they were on or near fens. The most important was in Laconia, at the mouth of the Eurotas, in a marshy but fertile plain near the sea. When the Dorians conquered the Peloponnesus they carried the Helots, the inhabitants of Helos, to Sparta as slaves.

HELSINGÖR. See ELSINORE, *ante*.

HELVETIAN REPUBLIC. See SWITZERLAND, *ante*.

HEMATINE (*ante*), the coloring matter which, when combined with a certain proteid body (probably the globuline of the older physiologists, since called by Preyer globine), forms hemoglobine (q.v.). All the iron belonging to the hemoglobin is a constituent of the hematine; still it is held by modern physiologists that the body hemoglobin is the real coloring matter of the blood, the hematine not being able to perform the functions of a colorizer and oxygen carrier alone. It must share that power with the proteid body. See HEMOGLOBINE.

HEMEROBAPTISTS, an ancient Jewish sect who made daily ablution an essential part of religion. Epiphanius, who mentions their doctrine as the fourth heresy among the Jews, classes the Hemerobaptists doctrinally with the Pharisees, from whom they differed only in that, like the Sadducees, they denied the resurrection of the dead. The name has been sometimes given to the Mendicans on account of their frequent ablutions; and in the *Clementine Homilies* St. John the Baptist is spoken of a Hemerobaptist. Mention of the sect is made by Hegesippus and by Justin Martyr in the *Dialogue with Tryphon*.

HEMEROCALLIS. See DAY-LILY.

HEMIBRANCHIATES, a group of bony fishes belonging to the order of TELEOSTS, which by some naturalists has been erected into an order, while the teleosts have been raised to the rank of a sub-class. The classification adopted in this work treats the teleosts (q.v.) as the third order in which are found the sticklebacks and pipe fishes (q.v.). The hemibranchiates, as the name implies, have imperfect gills or branchiæ connected with peculiarities of the skeleton.

HEMIGALE, a mammal of the family *viverridæ*, having a body resembling that of the weasel. Its fur is a grayish brown, with six or seven dark wide stripes across the back. It has a pointed head and nose, short ears, long tail, and strong thighs. It is about the size of the ichneumon, and feeds on eggs and small animals including birds. It is a native of the East Indies.

HEMOGLOBINE, the principal constituent of the red blood-corpuscles. It is the coloring matter of these bodies and consequently the coloring matter of the blood. It was formerly supposed that *hematine*, a substance which is intimately combined with a proteid body to form hemoglobine, was the coloring matter of the blood; but although iron plays an important part in respiration and in the changes of the color of the blood which take place in the various functions of nutrition, and although the iron is specially a constituent of the hematine factor of hemoglobine, it does not perform the functions connected with oxidation and with dioxidation except when in combination with that proteid body; in other words, except as it forms a part of the body called hemoglobine. The exact nature of the proteid constituent has not been precisely determined,

but has been regarded as the globuline(q.v.) of the older physiologists; whence the name hemoglobine, contracted from hematoglobuline. Hematine is therefore regarded as a derivative of hemoglobine, and not as a true proximate principle. Hemoglobine obtained from the rat, guinea-pig, squirrel, hedgehog, horse, dog, cat, and goose, crystallizes readily, in slender four-sided rhombic prisms. Those from the blood of the guinea-pig are rhombic octahedrons. Those of the squirrel are six-sided plates. Hemoglobine obtained from the blood of the ox, sheep, rabbit, pig, and man, crystallizes with difficulty. The causes of these differences are not known, but may depend upon the slight difference in the proportion of water of crystallization which has been found to exist. The crystals, when examined with the microscope, are of a bright scarlet, like that of arterial blood when viewed with the naked eye, but when the crystals are in mass they have a darker, more purplish appearance; but a solution in water has the same tint as arterial blood. Examined with the spectroscope, a dilute solution is observed to absorb certain rays of light in a peculiar way, a portion of the red end of the spectrum being absorbed, and a larger portion of the blue end; but the most characteristic phenomenon is the appearance of two strongly marked absorption bands between the letters D and E on Fraunhofer's scale, the narrow band being the most intense, and in extremely dilute solution the only one visible. By increasing the strength of the solution the bands are intensified and broadened, and the absorption spaces at each end of the spectrum also increase, and by further increasing the strength of the solution the bands may be brought together, so as to form one broad band, when the only rays of light which pass through the spectrum will be in the green and red portions, on either side of the combined bands. By still increasing the strength of the solution the green light becomes absorbed, leaving only the red rays to pass through, these being the last to disappear, which accounts for the natural red color of the solution when seen by transmitted light. Carefully prepared crystals of hemoglobine when placed in the vacuum of an air-pump part with a certain quantity of oxygen and change color. The quantity of oxygen given off is definite, 1 gramme of crystals parting with 1.76 cubic centimeters of oxygen. This oxygen is held in a rather loose state of combination, not forming a part of the permanent hemoglobine crystal, as in the following analysis by Hoppe-Seyler of the crystals taken from the blood of the dog: carbon 53.85; hydrogen 7.32; nitrogen 16.17; oxygen 21.84; sulphur 0.39; iron 0.43, with 3 or 4 per cent of water of crystallization. An ordinary solution of hemoglobine contains also a definite quantity of oxygen in a loose state (added to the quantity given in the above analysis), and which under the air-pump is yielded up, the color passing from scarlet to purple (oxyhemoglobine passing to reduced hemoglobine). This excess oxygen may also be discharged by passing hydrogen gas, which causes dissociation between the permanent hemoglobine and the loosely held oxygen. It may be also expelled by the use of reducing agents, such as ammonium sulphide, or an alkaline solution of sulphate of iron. When a reduced solution of hemoglobine is examined by the spectroscope the spectrum is changed from that of the unreduced solution which contains the excess of oxygen. The two absorption bands are absent, their place being occupied by a single, broader, though fainter band, and there is also less absorption at the blue end of the spectrum. Even in strong solutions much bluish light passes through, which explains the bluish color of reduced hemoglobine. When reduced hemoglobine, either in solution or in crystals, is exposed to the air it immediately absorbs oxygen, and if sufficient is present it returns to the state of oxyhemoglobine, each gramme absorbing 1.76 cubic centimeters of the gas. If this proportion of oxygen is not present the reduced hemoglobine takes up all there is, regaining the scarlet of oxyhemoglobine in proportion to the amount of oxygen absorbed. If oxyhemoglobine has been deoxidized by a reducing agent, and this latter is in excess, curious phenomena of alternate change of color will be observed on letting the tube stand for a time and then shaking it with air. When it has become purple, the act of shaking will be immediately followed by a change of color to scarlet. On standing a short time the solution will resume its purple color, again to be changed to scarlet on shaking. This experiment explains the change of color which takes place in the blood while performing its physiological functions in the system and in the lungs, parting and combining with oxygen alternately. The venous blood which is thrown from the right ventricle into the lungs has lost much of its excess of oxygen; its oxyhemoglobine is reduced to permanent hemoglobine, and it has a dark purplish color. It is only in asphyxiated blood, however, that the excess oxygen is wholly discharged, when the opaque blood looks almost black. In the lungs, where the blood meets with the inspired air, the carbonic acid gas which had been held in solution is given off, and the reduced hemoglobine receives again a quantity of excess oxygen and becomes scarlet in color. The oxygenated blood returns to the heart, whence it is thrown into the arteries, and thence into the capillaries, where an interchange takes place between their contents and the outlying tissue fluids which results in the reduction of the oxyhemoglobine to permanent hemoglobine, and of course a return to the purple color of venous blood. See RESPIRATION and NUTRITION.

HEMPEL, CHARLES JULIUS, b. Prussia, 1811; studied medicine in Paris, and in 1835 emigrated to New York, where he graduated at the New York university. In 1857 he was made prof. of materia medica in the homœopathic college of Pennsylvania.

He has written a number of important manuals and other works on homœopathic practice.

HEMPSTEAD, a co. in s.w. Arkansas, on Little Missouri, Red, and Little rivers, intersected by the Cairo and Fulton railroads; 700 sq.m. Pop. '70, 13,768. The surface is hilly, soil fertile, producing cotton, corn, etc. Co. seat, Washington.

HEMPSTEAD, a township and village in Queens co., N. Y.; pop. '70, of the township, 13,999; of the village, 2,316. The township originally extended n. and s. across Long Island, from the sound to the ocean, but was afterwards divided about midway, and the name Hempstead now belongs to the southern half. It contains the villages of Pearsalls, Rockville Center, Baldwins, Freeport, Garden City, Hempstead, and several smaller villages. There are few manufactures, the population being mainly engaged in farming and market-gardening. The main line and southern central branches of the Long Island railroad pass through the town. The county agricultural fair grounds are in the n. part of the town at Mineola, on the main line of the railroad. The fairs held there have a high reputation for the exhibition of horses, cattle, and poultry, comparing to advantage with the state fairs. On the ocean the island of Long Beach, belonging to the town, has been leased for a long term of years, and is occupied by one of the largest summer hotels near New York. The main hotel building is 900 ft. long, and there are large pavilions and bathing houses, and special railroad trains secure rapid access from New York and Brooklyn. Hempstead village is regularly laid out, with flagged sidewalks, and is lighted with gas. The dwellings are generally of wood, but well-built, and some very elegant. There are 5 churches, the Presbyterian church claiming to be the oldest Presbyterian society in the United States, organized in 1644. The Episcopal church has in its possession a charter of incorporation signed by king George II., and some communion plate given by queen Anne. There are two public halls, four engine-houses, with an excellent volunteer fire department, three principal hotels, a steam flour mill, molding mill, and about 20 pieces of mercantile business.

HEMSTERHUY, or HEMSTERHUIS, FRANÇOIS, 1720-90; a Dutch writer on moral philosophy and æsthetics, studied at the university of Leyden, and for many years acted as secretary to the state council of the united provinces. He continued, however, the study of philosophy partly by social intercourse with a few similarly disposed friends, and partly by correspondence with philosophical writers of other countries, mainly with Jacobi. His writings, though not of high speculative worth, are distinguished by elegance of form and by a touch of refined sentiment. His most direct contributions to philosophy are in the department of æsthetics.

HEN. See FOWL, *ante*.

HENAULT, CHARLES JEAN FRANÇOIS, 1685-1770; a French historian, educated at the Jesuit college des Quatre-Nations. Captivated by the eloquence of Massillon, he entered the oratory with the view of becoming a preacher, but after two years' residence he changed his intention, and, inheriting a position which secured him access to the most select society of Paris, he at an early period achieved distinction by his gay, witty, and graceful manners, and by various light poetical pieces, and two discourses which respectively gained a prize at the French academy in 1707, and at the academie des Jeux Floraux in 1708. In 1703 he became counselor of the parliament of Paris, and in 1710 was chosen president of the court of *enquêtes*. He was admitted into the French academy in 1723, and subsequently into the leading literary societies of Europe. After the death of Bernard de Coubert he became superintendent of the household of queen Marie Leczinska, whose intimate friendship he had previously enjoyed. On his recovery in his fiftieth year from a dangerous malady, he professed to have undergone religious conversion and retired into private life, devoting the remainder of his days to study and devotion. His devotion, however, did not prevent his continuing a near friendship with Voltaire. His chief literary work was the *Abrégé Chronologique*, first published in 1744 without the author's name. It is valuable both for popular use and as a work of reference. In the compass of two volumes he has comprised the whole history of France from the earliest times to the death of Louis XIV. His information is for the most part drawn from original sources, and for such a work the number of errors is remarkably small. Besides some other historical works of minor importance, Henault wrote several dramatic pieces of no particular merit. His *Mémoires* published in 1854, are fragmentary and disconnected, but contain many interesting anecdotes and details regarding persons of note.

HENDERSON, a co. in Illinois on the Mississippi, intersected by Henderson river, and the Chicago, Burlington, and Quincy railroad; 366 sq.m.; pop. '70, 12,582. The surface is hilly and to a large extent covered with forests, soil fertile; chief productions: corn, wheat, and pork. Co. seat, Oquawka.

HENDERSON, a co. in w. Kentucky on the Ohio and Green rivers, crossed by the St. Louis and Southwestern railroad; 550 sq.m.; pop. '70, 18,457—5,990 colored. It has a hilly surface and is to a large extent covered with forests. The soil is fertile, producing tobacco, corn, pork, etc. Co. seat, Henderson.

HENDERSON, a co. in w. North Carolina, w. and n. of the Blue Ridge and e. of French Broad river; 350 sq.m.; pop. '70, 7,706—1,208 colored. The surface is rough,

and in large part forest land. The valleys are fertile, producing chiefly corn. Co. seat, Hendersonville.

HENDERSON, a co. in w. Tennessee drained by afluent of Tennessee river; 690 sq. m.; pop. '70, 14,217—2,408 colored. It is level, with large forests of oak, chestnut, etc. The soil is fertile, producing cotton, corn, etc. Co. seat, Lexington.

HENDERSON, a co. in n.e. Texas on Trinity and Natchez rivers; 934 sq. m.; pop. '70, 6,786—1654 colored. It has an undulating surface and fertile soil; chief productions: cotton, corn, and pork. Co. seat, Athens.

HENDERSON, a city in Henderson co., Ky., on the St. Louis and Southwestern railroad and the Ohio river; pop. 4,171. It has a court-house, 10 churches, schools, foundries, car-works, grist mills, saw mills, a woolen factory, and a planing mill.

HENDERSON, ALEXANDER (1583-1646), was a Scotch ecclesiastic, who became professor of rhetoric and philosophy at St. Andrews in 1610. He was presented to the living of Leuchars by archbishop Gladstones, where as his religious principles were antagonistic to those of his parishioners he was for a long time unpopular, but as he later in life changed his views he became one of the most influential ministers of Scotland. He took an active part against Episcopal innovations, and was mainly responsible for the "National Covenant" which was publicly signed in Greyfriars church, Edinburgh, 1638. During the troubled times of king Charles I.'s reign, Henderson's influence was greatly felt, in the negotiations for peace between the Scottish ecclesiastics and the court, and he had a personal interview with the king, when he accompanied the commissioners to London, and when Charles visited Scotland in state (1641) Henderson attended him as chaplain, and later on went to Oxford to mediate between the king and his parliament. In 1643 Henderson was elected moderator for the third time in the Edinburgh assembly, and in that capacity presented a draft of the famous "Solemn League and Covenant." He, with Baillie, Rutherford, and others, was sent to London to represent Scotland in the Westminster assembly, when the "Solemn League" with slight modifications passed both houses and became law for the two kingdoms. When in 1646 the king joined the Scottish army and retired with it to Newcastle, he sent for Henderson, and discussed the systems of church government in a number of papers. But Henderson's health was failing; he set off on his return to Scotland, and eight days after his arrival died at Edinburgh, and his death was the occasion of a national mourning in Scotland. Henderson is one of the greatest men in Scottish history, and next to Knox the most renowned ecclesiastic of Scotland. His political genius was great, and he was, as prof. Masson observed, "a cabinet minister without office." He has left a deep mark in the history both of England and Scotland, and the Presbyterian church of to-day owes much to his influence. He is justly looked upon as the second founder of the Scottish Reformed Church.

HENDERSON, EBENEZER, 1784-1858; a Scotch dissenting minister, and a prolific miscellaneous writer. He was to accompany rev. John Paterson to India (1805), and as the East India company would not allow British vessels to convey missionaries to India, Henderson and his colleague were forced to go to Denmark and await the chance of a passage to Serampore. Being delayed, they decided to remain where they were, and Henderson was fixed at Elsinore, and devoted himself to the distribution of Bibles in the Scandinavian countries. In the course of his labors he visited Sweden and Lapland, Iceland, Denmark, and Germany. A greater part of the time he acted as agent for the British and Foreign Bible society. In 1818 he accompanied Dr. Paterson through Russia as far as Tiflis, and in 1822 was asked by prince Galetzen to assist in translating the Scriptures into the various languages spoken in the Russian empire. Returning to England after 20 years foreign labor, Henderson was appointed tutor of the Mission college, Gosport. He succeeded Dr. Harrison, 1830, as professor of oriental languages in Highbury Congregational college, which position he retained until 1850, when he was forced to resign on account of his infirmities. His last work was a translation of the book of Ezekiel. His linguistic attainments were very great; he made himself acquainted not only with the ordinary languages of scholarship, but also with Hebrew, Syriac, Ethiopian, Russian, Arabic, Tartar, Persian, Turkish, Armenian, Manchoo, Mongolian, and Coptic. The first Bible society in Denmark was organized by him, 1814; he was associated both with the London religious tract society and the society for the propagation of the Gospel among the Jews. He published an account of his travels in Iceland, and amongst many other works was the author of *Biblical Research and Travel in Russia, Divine Inspiration*, and the annotations of many of the Scriptures.

HENDERSON, JAMES PINCKNEY, 1808-58; b. N. C., but passed his life chiefly in Texas and Mississippi. He was a general in the army of Texas during the revolution of 1836; afterwards secretary of state; minister to England, and in same capacity to the United States to secure annexation. He was the first governor after the annexation. He served in the Mexican war, and was presented with a sword by congress. In 1857 he was chosen senator from Texas.

HENDRICKEN, THOMAS FRANCIS, D.D., b. Ireland, 1827; graduated at a college in Kilkenny, and was ordained a Roman Catholic priest in Dublin. He was one of the

American mission in 1853, and served in several parishes in Rhode Island and Connecticut. In 1872 he was made bishop of Providence.

HENDRICKS, a co. in w. central Indiana, drained by tributaries of Eel river, and intersected by three railroads; 400 sq.m.; pop. 79, 20, 277. It is mostly level, with large forests, and the soil is fertile; chief productions: corn, wheat, pork, and cattle. Co. seat, Danville.

HENDRICKS, THOMAS ANDREWS, b. Ohio, 1819; graduated at South Hanover college, and was admitted to the Pennsylvania bar in 1843. He pursued his profession in Indiana. He became a member of the legislature and of the state constitutional convention; was twice chosen to congress; was commissioner of the general land office, and in 1863 became a U. S. senator. In 1868 he was before the democratic national convention as a candidate for president, but the nomination was given to Horatio Seymour. From 1873-77 he was governor of Indiana. In 1876 he was candidate for vice-president on the democratic ticket, but was not elected.

HENLE, FRIEDRICH GUSTAV JAKOB, b. Bavaria, 1809, a physician and physiologist; in 1852 professor of anatomy and director of the anatomical institute at Göttingen; noted for the use of the microscope in anatomical research. He has published several works on anatomy and pathology.

HENLEY, JOHN, 1692-1759; an English clergyman known as "Orator Henley," noted for his eccentricities; while at college in Cambridge, Feb., 1712, he under the pseudonym of Peter de Quir addressed a letter to the *Spectator* displaying no small wit and humor. After graduating he became assistant and then head-master of the grammar school of his native town, uniting with these duties those of assistant curate, besides publishing in 1714 a poem entitled *Esther, Queen of Persia*. He also compiled a grammar of ten languages entitled *The Complete Linguist*. Removing to London, he was appointed assistant preacher in Ormond street and Bloomsbury chapels, and in 1723 was presented to the rectory of Chelmondiston in Suffolk; but residence being insisted upon, he resigned both his appointments, and July 3, 1726, opened what he called an "oratory" in Newport market, which he licensed under the toleration act. He introduced many peculiar alterations into his service, and drew up a "primitive liturgy," in which he substituted for the Nicene and Athanasian creeds two creeds taken from the apostolic constitutions; for the Eucharist he made use of unleavened bread and mixed wine; he distributed at the price of one shilling medals of admission to his oratory. He is described by Pope in the *Dunciad* as "preacher at once and zany of his age." Besides his sermons on Sunday he delivered lectures on Wednesday chiefly on social and political subjects; and he also projected a scheme for connecting with the "oratory" a university intended to be the foster-mother of the arts and sciences. For some time he edited the *Hyp Doctor*, a weekly paper established in opposition to the *Craftsman*, and for this service he enjoyed a pension of £100 a year from sir Robert Walpole. At first his orations drew great crowds, but his audience latterly dwindled almost entirely away.

HENNEPIN, a co. in e. Minnesota, on the Mississippi and Minnesota rivers, crossed by the St. Paul and Pacific, and the Minneapolis and St. Louis railroads; 600 sq.m.; pop. 75, 48, 725. The surface is undulating, and dotted with small lakes. The soil is fertile; chief productions: wheat, corn, oats, and butter. Co. seat, Minneapolis.

HENNEPIN, LOUIS, 1640-1701; b. Belgium; a Roman Catholic (Franciscan) missionary among the American Indians. He preached for some time in Holland, and in 1675 was sent to Canada with La Salle, and bishop Laval. The next year he was in the Indian mission of fort Frontenac, and visited the Mohawk country. Two years later he accompanied La Salle's expedition to Niagara and the upper lakes, and constructed a vessel in which they proceeded by the Érie, Huron, and Michigan lakes, to St. Joseph's river, which they navigated in canoes. Reaching the Illinois, they built fort Crèvecoeur. Here La Salle left them in search of supplies, and Hennepin and his party proceeded up the Mississippi till in April, 1680, they were captured by Sioux Indians and taken to the native villages. During this journey Hennepin discovered the falls of St. Anthony, and one of his party penetrated as far as lake Superior and made a treaty of peace. Not long afterwards Hennepin returned to Quebec and sailed for France where he published his *Description de la Louisiane, et Nouvelle découverte au Sud-ouest de la Nouvelle-France*, containing an account of La Salle's expedition and of the missionary's own discoveries. Hennepin refused to return to America, though ordered to do so by his superiors of the church, and took refuge in Holland. After La Salle's death Hennepin published his *Nouvelle découverte d'un très grand pays situé dans l'Amérique*. In this he claimed to have been the first man to descend to the mouth of the Mississippi; a statement which was long ago shown incorrect. His works won great popularity and were printed in several languages.

HENOTICUM, an edict of the emperor Zeno, published A.D. 482, and intended to unite the Eutychians with the Catholics. It was procured from the emperor by Acacius, patriarch of Constantinople; and was in the form of a letter, addressed by Zeno to the clergy and the people of Egypt and Libya. As it contained a favorable mention of the

council of Chalcedon, it was supposed to favor the Eutychian party; and after much opposition, was at length formally condemned by pope Felix II.

HENRICIANS, or **HENRICANS**, a sect founded by Henry of Lausanne in the 12th century. Grieved at the corruption of the times, he abandoned the order to which he belonged, and became an earnest preacher of righteousness. His consistent life and the eloquence of his discourses deeply moved the people. At first, Hildebert the bishop favored him, but afterwards drove him from Mans. Joining the disciples of Peter of Bruys in Provence, he was arrested by the archbishop of Arles, and at the second council of Pisa, 1134, was declared a heretic, and placed in a cell. Subsequently released, he again went to the south of France, where he had great influence over the lower classes. He was arrested by pope Eugenius III., and at the council of Rheims condemned to perpetual imprisonment, but died in prison, 1149.

HENRICO, a co. in e. Virginia between Chickahominy and James rivers, intersected by the Chesapeake and Ohio railroad; 250 sq.m.; pop. '70, 66,179—31,031 colored. The surface is hilly and the scenery picturesque. The chief productions are corn, wheat, and oats. Bituminous coal is found. Co. seat, Richmond (the state capital).

HENRIETTA, **ANNA**, 1644-70; daughter of Charles I. of England and queen Henrietta Maria; reared by her mother in a convent in France. Louis XIV. was her cousin, but she found no favor in his eyes until her brother Charles II. became reigning king of England. She then (1661) married the only brother of the French king, Philip, duke of Orleans. She was a great favorite at the French court, but her husband treated her with aversion. She died suddenly after intense suffering, and the general belief prevailed that she was poisoned. Bossuet's funeral discourse in her honor is a masterpiece of oratory.

HENRIETTA MARIA, 1609-66; queen consort of England, wife of Charles I. She was a daughter of Henry IV. of France. When the first overtures for her hand were made on behalf of Charles, then prince of Wales, 1624, she was but just 14 years of age. Her brother, Louis XIII., only consented to the marriage on the condition that the English Roman Catholics were relieved from the operation of the penal laws. When, therefore, she set out for her new home in June, 1625, she had already pledged the husband to whom she had been married by proxy on May 1, to a course of action which was certain to bring unpopularity upon him as well as upon herself. That husband was now king of England. The early years of the married life of Charles I. were most unhappy. He soon found an excuse for breaking his promise to relieve the Roman Catholics. His young wife was deeply offended, and the favorite Buckingham did all in his power to promote disunion between the king and queen. After the assassination of Buckingham in 1628, the barrier between them was broken down, and the affection which from that moment united them never lessened. For some years Henrietta Maria's chief interests lay in her young family, and in the amusements of a gay and brilliant court. She loved dramatic entertainments, and her participation in the private rehearsals of the *Shepherd's Pastoral*, written by her favorite Walter Montague, probably subjected her to the savage attack of Prynne. With political matters she scarcely interfered. Even her co-religionists obtained little aid from her until 1637. She then appointed an agent to reside at Rome, and a papal agent, a Scotchman named Com, accredited to her, was soon engaged in effecting conversions amongst English gentry and nobility, but Protestant England took alarm. When the Scottish troubles broke out, she raised money from her fellow Catholics to support the king's army on the borders in 1639. During the session of the short parliament in 1640, the queen urged the king to oppose himself to the house of commons in defense of the Catholics. When the long parliament met, the Catholics were assumed to be the authors of every arbitrary scheme in the plans of Strafford or Laud. Before it had sat for two months, the queen was urging upon the pope the duty of lending money to enable her to restore her husband's authority. She threw herself heart and soul into the schemes for rescuing Strafford and coercing the parliament. The army plot, the scheme for using Scotland against England, and the attempt upon the five members were results of her political activity. In the following year she crossed over to the continent, and in Feb., 1643, she landed at Burlington quay, placed herself at the head of a force of loyalists, and marched through England to join the king near Oxford. After a little more than a year's residence there, April 3, 1644, she left her husband to see his face no more. At Exeter she gave birth to her youngest child who was one day to be duchess of Orleans, and to negotiate the treaty of Dover. Henrietta Maria found a refuge in France. Richelieu was dead, and Anne of Austria was compassionate. As long as her husband was alive the queen never ceased to encourage him to resistance. During her exile in France she had much to suffer. She brought up her youngest child Henrietta in her own faith, but her efforts to induce her youngest son, the duke of Gloucester, to take the same course only produced discomfort in the exiled family. The story of her marriage with her attached servant lord Jermyn, needs more confirmation than it has yet received to be accepted, but all information which has reached us of her relations with her children point to the estrangement which had grown up between them. When after the restoration she returned to England, she found she had no place in the new court. She received from parliament a grant of £30,000 a year in compensation for the loss of her dower lands, and the king

added a similar sum as a pension from himself. In Jan., 1661, she returned to France to be present at the marriage of her daughter Henrietta to the duke of Orleans. In July, 1662, she set out again for England, and took up her residence once more at Somerset house. Her health failed her, and on June 24, 1665, she departed in search of the clearer air of her native country. She died Aug 31, 1666.

HENRIQUEL-DUPONT, LOUIS PIERRE, b. Paris 1797. He entered the studio of M. Pierre Guérin, and after remaining there three years, turned his attention to engraving. His first production, the "Portrait of a Young Woman with her Infant," gained the second medal at the exhibition of 1822. He produced in succession a "Portrait of M. de Pastoret," "Strafford," "The Interment of Christ," after Paul Delaroche; "The Abdication of Gustavus Vasa," after Hersent; "The Disciples at Emmaus," after Paul Veronese, etc.; and is considered the most eminent French engraver of the day. In 1853 and 1855 he received the grand medal of honor, was decorated Aug. 14, 1831, and succeeded Richomme at the *académie des Beaux-Arts* in 1849. He was elected an honorary member of the Royal academy of London in 1869.

HENRY, a co. in Alabama, between Georgia on the e. and Florida on the s.; 930 sq.m.; pop. '70, 14,191. On the e. flows the Chattahoochee. The county is fertile, but abounds in immense pine forests. Co. seat, Abbeville.

HENRY, a co. in n.w. Georgia, bounded n.e. by South river; 450 sq.m.; pop. '80, 14,193—5,236 colored. It has a hilly surface, and much forest land. Chief productions: cotton, corn, and wheat. Co. seat, McDonough.

HENRY, a co. in n.w. Illinois, on Rock river, and its affluents intersected by the Chicago, Rock island and Pacific, and two other railroads; 839 sq.m.; pop. '70, 35,413. The surface is mostly prairie, and the soil is fertile. Corn, wheat, oats, cattle, and pork are the main products. Co. seat, Cambridge.

HENRY, a co. in e. Indiana, on Big Blue river and the Pittsburg, St. Louis, and Cincinnati, and the Fort Wayne, Muncie, and Cincinnati railroads; 400 sq.m.; pop. '70, 24,986. The surface is undulating, and much of it is covered with forests. The soil is fertile, producing corn, wheat, oats, and pork. Co. seat, Newcastle.

HENRY, a co. in s.e. Iowa, on Skunk river, traversed by the Burlington and Missouri river railroad; 432 sq.m.; pop. '80, 20,826. It has a prairie and woodland surface, and the soil is fertile. Chief productions: corn, wheat, oats, hay, and pork. Co. seat, Mount Pleasant.

HENRY, a co. in n. Kentucky, s.w. of Kentucky river which is here navigable, and traversed by the Louisville, Cincinnati and Lexington railroad; 220 sq.m.; pop. '70, 11,066—2,438 colored. It has an undulating surface with abundant forests. The soil is fertile; chief productions: tobacco, corn, wheat, and pork. Co. seat, Newcastle.

HENRY, a co. in w. Missouri on Grand river, crossed by the Missouri, Kansas and Texas railroad; 750 sq.m.; pop. '80, 23,843—989 colored. The surface is chiefly prairie, with forests of oak, hickory, etc. Chief productions, corn, wheat, oats, and bituminous coal. Co. seat, Clinton.

HENRY, a co. in n.w. Ohio, on Maumee river, crossed by a division of the Baltimore and Ohio, and the Wabash railroads; 420 sq.m.; pop. '70, 14,028. It has a level surface, and much of it is covered with forests. Corn, oats, and hay are the main products. Co. seat, Napoleon.

HENRY, a co. in w. Tennessee, on the Kentucky border, bounded e. by Tennessee river; 600 sq.m.; pop. '70, 20,380—5,204 colored. The surface is level, and the soil fertile; chief productions: tobacco, cotton, and corn. Co. seat, Paris.

HENRY, a co. in s. Virginia on the North Carolina border, intersected by Smith river; 450 sq.m.; pop. '70, 12,303—5,581 colored. It has a rough surface with large forests. Productions: tobacco, corn, and oats. Co. seat, Martinsville.

HENRY, a post village in Marshall co., Ill., on the Illinois river and a branch of the Chicago, Rock island and Pacific railroad; 33 m. n.e. of Peoria; pop. 2,162. It has 8 churches, a bank, a newspaper, and some manufactories. Marshall college, founded in 1855, is the principal institution.

HENRY I., 1005-60; king of France, grandson of Hugh Capet. When driven out by his mother (Constance of Aquitaine) who favored her youngest son (Robert) Henry took refuge (1031) with duke Robert II. of Normandy. With the duke's help he soon compelled her to acknowledge his rights. Constance died in 1032, and Henry, by granting the duchy of Burgundy to his brother, secured his good-will. After the death of Robert "the devil," Henry, who had first supported William the bastard, in 1053 and 1054, tried to weaken the power of the Normans. Leaguings himself with the count of Anjou, and calling his brother Eudes into the field, he invaded Normandy from Evreux. When, however, Eudes had been defeated at Mortemer, Henry drew back in haste, and left the Normans to themselves. In 1059 he caused his eldest son Phillip to be crowned as joint king, and died in 1060. He was an active prince, with his sword rarely in the scabbard. Henry's acts and character did little to strengthen the monarchy. The Normans were independent of him, with their frontier barely 25

m. w. of Paris; while to the s. his authority was bounded by the Loire, and in the e. the count of Champagne was only nominally his subject. Henry's first wife Maud, daughter (or niece) of Conrad the Salic, died childless; his second, Anne, daughter of Jaroslav, granduke of Russia, bore him two sons—Philip his successor, and Hugh, count of Vermandois.

HENRY I., 876-936; king of Germany, son of Otto duke of Saxony. Henry was distinguished in early youth for the courage and energy with which he warred against the Slavonic tribes to the east of his native duchy. Otto, who died in 912, appointed Henry his successor, not only as duke of Saxony, but as lord of Thuringia and part of Franconia. Conrad I. stimulated by certain ecclesiastical advisers whom Henry's independent bearing towards the church had deeply offended, resisted the claims of the young duke; but he was ultimately left in possession of all the lands over which his father had ruled. After Conrad's death Henry was chosen king by the Franconian and Saxon nobles, and he had not much difficulty in securing the acquiescence of the rest of Germany. For some years Lotharingia or Lorraine had held an uncertain position between the kingdoms of the East and the West Franks, as Germany and France were then called; but at this time duke Giselbert, who was an old friend of Henry, quarreled with Charles the simple, and transferred his allegiance to the German king. For eight centuries afterwards Lorraine remained a part of Germany. From the time of Louis the child, Germany had been tormented by the Hungarians, who were still a savage race, and who had the advantage of fighting on horseback while the Germans resisted them on foot. In 922 a Hungarian chief was captured, and his people were compelled to purchase his release by agreeing to a nine years' truce, on condition that Henry should during this time pay an annual tribute. In the n. districts the Germans had hitherto lived for the most part in small villages or on separate settlements. Henry began building fortified cities throughout Saxony and Thuringia, and in the remaining duchies his example was extensively followed. He also trained his vassals to meet the enemy on horseback, thus giving a strong impetus to the movement which resulted in the institutions of chivalry. When his arrangements were complete he tried his new force in a contest with the Danes and with some Slavonic tribes, whom he utterly defeated. In 933 the Hungarians demanded as usual the tribute which had till then been punctually paid, and when it was refused invaded Thuringia with a great army. Henry twice defeated them, and they were so overwhelmed by this misfortune that they did not enter Germany for some years, and were never again seen in the northern duchies. Having broken the power of his chief enemies, Henry established the marches of Schleswig, of Meissen, and perhaps of Brandenburg. In his home government he acted with great precaution and judgment. The dukes had become so powerful that there was some danger of their altogether overshadowing the throne. Instead of directly forcing them to submission, as was afterwards done by his son Otto, he attached them to his interests by confirming them in many of their rights and by acting as a mediator in their disputes. Towards the close of his life his position was so secure that he resolved to go to Rome and claim the imperial crown. In the midst of his preparations he died.

HENRY II., SAINT, 972-1024; emperor of Germany, grandson of Henry I. He was crowned at Mainz, June 7, 1002. His most determined enemy during the greater part of his reign was Boleslaus II. of Poland, who annexed Bohemia, and during the king's absence in Italy broke into Lusatia and Meissen. Henry hurried back, defeated Boleslaus, in 1005, and granted Bohemia fief to Jaromir, son of the previous duke. Boleslaus, however, continued the war, which was not ended until 1018, when Henry was obliged to conclude peace on terms more favorable to Poles than he would voluntarily have granted. In the midst of this struggle he had to make war on Adalbero, his wife's brother, who seized the archbishopric of Trèves, and was protected in his claim by another brother of the empress, the duke of Bavaria. Both were overcome, and deprived of their dignities, although Bavaria was ultimately restored to the elder of the two brothers. Henry also put down rebellions in Flanders and Meissen, and concluded an important treaty with Rudolf III. of Burgundy, whereby after Rudolf's death the country was to be united to Germany. In 1018 Henry went for the second time to Italy, where Harduin had again raised himself to the throne. The usurper was displaced, and in 1014 Henry was crowned emperor at Rome by Benedict VIII.; whom he had confirmed in the papal see in opposition to the anti-pope Gregory. At the request of Benedict the emperor returned to Italy in 1022 in order to drive back the Greeks who were steadily pressing northwards. In this enterprise he associated himself with the Normans, who thus became one of the most important factors in the political life of Italy. Henry was canonized by pope Eugenius III.; and at a later time his wife, Cunigunde, was also ranked among the saints. The church has rarely had a more splendid benefactor than Henry II., whose ruling policy was to counter-balance the power of the great nobles by increasing that of the spiritual princes. He also founded the bishopric of Bamberg, which was placed under the immediate jurisdiction of the pope, and to which he left by will all his treasure and his magnificent allodial possessions.

HENRY V., 1081-1125; emperor of Germany. In 1098 his elder brother, Conrad, having forfeited his right to the throne by rebellion, Henry was appointed his father's

successor. Six years afterwards he himself rebelled against the emperor. The papal party, with which he allied himself, took for granted that when he mounted the throne, church and state would instantly be reconciled; but their hopes were disappointed. The main point for which Henry IV. had contended was the right of investing the bishops with ring and staff. When Henry V. succeeded him in 1106, pope Pascal II. demanded that this right should be given up, but he replied that he could not resign powers that had been exercised by his predecessors, and the loss of which would imply that the ecclesiastical lands of Germany would be removed from secular control. In 1110 he entered Italy at the head of 30,000 men. Alarmed by this display of force Pascal withdrew his claims, and a day was appointed for the coronation of Henry as emperor. The opposition of the Roman prelates made it impossible for the pope to proceed with the ceremony, whereupon he and his cardinals were made prisoners. Pascal then formally recognized the right of investiture, and Henry received the imperial crown. When the Germans had recrossed the Alps, Pascal renounced the treaty he had concluded, and the emperor was excommunicated. As many of the princes were pleased to find this opportunity for rebelling, Germany again became the scene of confused contests like those which had plunged it in misery during Henry IV.'s long reign. In 1116 the emperor went a second time to Italy and drove Pascal from Rome; and after Pascal's death he caused Gregory VIII. to be appointed pope. The extreme papal party, however, selected Gelasius II., who renewed the sentence of excommunication against Henry. The latter returned to Germany in 1119, and at a diet in Tribur succeeded in allaying the hostility of the more important among his enemies. Pope Calixtus II., who succeeded Gelasius in 1119, now found it necessary to offer a compromise; and the controversy between the empire and the papacy was for the time closed by the concordat of Worms, 1122, in which it was agreed that at every election of a prelate the emperor should have the right of being present either in person or through a representative, and that the chosen bishop, before being consecrated, should receive his lands and secular authority in fief of the crown. So far the advantage rested with the emperor; but the papacy gained by being recognized as a power which had the right of negotiating with the empire on equal terms, and by the acknowledgment of the claim of the church to nominate its own rulers. Notwithstanding this settlement Germany did not long enjoy peace, for a number of petty wars broke out which Henry was not strong enough to quell.

HENRY VI., 1165-97, emperor of Germany, crowned in 1169. He shared the intellectual culture of his time, and was distinguished for the splendor of his political schemes; but he was of a stern disposition, and in order to attain his ends was sometimes guilty of horrible cruelty. Henry the lion, who had been banished to England by Frederick I., returned to Germany after the departure of the latter for the Holy Land. Henry resisted him, but on becoming the reigning sovereign he concluded peace, and hastened to Rome, where he was crowned emperor in 1191. Through his wife Constantia he had a right to the throne of Sicily; but the Sicilian nobles had made count Tancred, an illegitimate son of Constantia's brother, king. After receiving the imperial crown Henry advanced against Tancred, and the whole of southern Italy, except Naples, was quickly in his possession. Before Naples his army was struck by pestilence, and he was forced to return to Germany. There he suppressed various private wars, and compelled Henry the lion to acknowledge his supremacy. The great ransom which he received from Richard I. of England enabled him to fit out a fine army, and with this he descended upon Italy in 1194, and without much difficulty conquered the Sicilian kingdom. Tancred was dead, but he had left a number of relatives, who were so barbarously treated that the people were seized with terror, and not even the sentence of excommunication which the pope pronounced against Henry could induce any one to express dissatisfaction with his rule. On his return to Germany it was easy for him, with the prestige which he had now acquired, to enforce submission; and so great was his authority that, in 1196, he endeavored to secure a declaration that the crown should be declared hereditary in his family. Had he lived some years longer he would probably have succeeded, but in 1197 he died in Messina.

HENRY VII., 1282-1313; emperor of Germany, elected in 1308. When he came to the throne Bohemia was subject to Henry of Carinthia, whom the people extremely disliked. The king at once displaced him, and enriched his own family by granting Bohemia, at the request of the Bohemians themselves, to his son John, whose claims were rendered secure by his marriage with Elizabeth, the daughter of Wenceslaus II. For some time no German king had sought the imperial crown; but Henry resolved to revive the traditions which were dying out, and with a view to this result did what he could to compose the differences between the nobles and to gain their allegiance. At this time there were signs of rapid progress among the cities, and had a strong king devoted himself to their interests, he might have established his throne on a solid basis. Unfortunately the easiest way in which Henry could obtain immediate scope for his plans in Italy was to ally himself with the princes against the cities, and this was, in most instances, the course which he adopted. His visit to Italy was looked forward to with great eagerness by the Ghibellines. He held aloof at first from both the great parties in the state. In 1312 he was crowned emperor in Rome, hav-

ing previously received the iron crown in Milan. But while he was in Rome, Robert of Naples was there also with a strong army, and in order to obtain adequate support it was necessary for Henry to declare himself on the side of the Ghibellines. He then resolved to conquer Naples, but while advancing on this expedition he died at Buonconvento. It was generally believed at the time that he had been poisoned by a Dominican monk, but this was not proved by satisfactory evidence.

HENRY THE DEACON, variously known as of Cluny, Lausanne, and Toulouse. He was born towards the close of the 11th c., abandoned the cloister 1115, on account of the hideous moral depravity of the clergy and church authorities, and commenced his career as itinerant preacher. His first denunciations were uttered at Lausanne; thence he betook himself to France, following in the steps of Peter of Bruys. His character soon made itself felt; his eloquence attracted the people, and no denunciations from the ecclesiastical authorities had any effect in restraining him. At last, Hildebert, bishop of Le Mans, expelled him from his diocese as an agitator, and we next find him in Provence; but in 1134 he was arrested as a dangerous stirrer-up of the people, and condemned by the council of Pisa to imprisonment, which, however, was not of long duration. The last years of his life were spent at Toulouse, where pope Eugenius thought it necessary to take active measures for the defense of his church, and Henry was condemned to prison, and died in obscurity there about the year 1148. His followers were dispersed.

HENRY, CALEB SPRAGUE, D.D., b. Mass., 1804; graduated at Dartmouth, and studied theology at Andover. In 1828 he became Congregational minister at Greenfield, Mass., and in 1833 removed to Hartford, Conn. About 1834 he started *The American Advocate of Peace*, the organ of the peace society. In New York, in 1835, he was pastor of a Protestant Episcopal church, and subsequently professor of moral and intellectual philosophy in Bristol college. In 1837, with the aid of rev. Francis L. Hawks, he established the *New York Review*. Two years later he was professor of history and philosophy in the New York university. Among his numerous works are *Compendium of Christian Antiquities*; *Moral and Philosophical Essays*; *Houshold Liturgy*; and several translations from the French. He died in 1874.

HENRY, JOSEPH, LL.D., 1797-1878; b. N. Y.; educated in Albany academy, where he was professor of mathematics in 1826. His attention was turned to electrical experiments, and he published in 1828 results of modifications in the appliance of electro-magnetism which attracted wide attention, particularly in the application of magnetic force at long distances. About this time he invented a machine worked by magnetism, in which he showed that an oscillating iron bar inclosed in insulated copper wire which was automatic in action would oscillate as long as the magnetic force was applied. He demonstrated the remarkable power that might be produced by a small galvanic apparatus, exhibiting in 1829 electro-magnets which possessed a far greater power than any before tried. One such, occupying only a cubic foot of battery space, is capable of supporting 3,500 lbs. In 1831 was successful in an attempt to make a bell ring at the end of a mile of wire. In the same year he published his observations, and claimed to be the originator of the idea that communication with distant places might be made feasible by magnetism, some years before Morse reduced the matter to practice. In 1832 he became professor of natural philosophy in Princeton college. There and in Europe he pursued his investigations and experiments, and made the acquaintance of distinguished scientists. On the establishment of the Smithsonian institution (1846), he was selected as secretary and chief director, holding the position through life. In 1849 he was chosen president of the American association for the advancement of science, and from 1868 was president of the National academy of sciences. In 1871 he was head of the lighthouse board, in which capacity he introduced valuable improvements in the service. Among his publications are *Contributions to Electricity and Magnetism*, and a great number of papers in the scientific journals, and the reports of the Smithsonian institution. Among his chief contributions to science are the electro-magnet (indispensable to telegraphy), improvements in fog-signals and in coast lights. His observations were also of great service in the lately established signal service. He spent his life in scientific research, without thought of pecuniary profit for himself.

HENRY, PATRICK (*ant.*), 1736-99; was a native of Virginia, and the son of a Scotch emigrant. He was so little promising a scholar, that his father was ready to give up his education in despair, but when he was 14 years old he was so impressed with the fervid eloquence of Samuel Davies, a celebrated Presbyterian preacher, that the fire of oratory kindled in his heart. In his business life Patrick was careless and even shiftless, and seldom successful in his undertakings. He was slovenly in dress, and showed no aptitude for business of any kind. Scraping a violin, torturing a flute, following the hounds and relating anecdotes, constituted his ambition. At the time that he married the daughter of a farmer, a Miss Shelton, his business collapsed and he became wretchedly poor. He next tried farming, but had neither the perseverance nor the knowledge that insure success, and after one more of many failures he opened a store, and succeeded in failing sooner than in his earlier ventures. When no customers appeared he would close his store and go fishing. But in his more sensible intervals he studied such books as he could find, and managed to gain a fair idea of the Latin

and Greek authors. Having utterly failed in farming and in trade, he made an attempt at the law, and after only a month and a half's study, had the boldness to ask for license to practice. This was granted on the condition that he should extend his studies before undertaking to practice. Practice was not easy to obtain, and the necessities of his family increased. In fact they were supported by his wife's father, who kept a small tavern at Hanover Court-House, Patrick now and then assisting in the duties of the house. But suddenly (in 1763) one of those strokes of fortune that develop intellectual giants overtook him, and he was engaged in the place of a more experienced advocate who refused to undertake the defense in a case, now forgotten, but long known as the "cause of the parsons," of which the main points were as follows: In those days in Virginia the priests or clergy were paid to a great extent in produce, and among their annual receipts were entitled to 16,000 lbs. of tobacco. In 1755 a severe drought occurred, which, following the French-Indian war, greatly reduced the means of the people. On this account the colonial legislature provided that all debts due in tobacco might be paid in money at 16s. 8d. (English money) per 100 pounds. This reduced the income of the ministers about two thirds. A similar law passed in 1758 gave rise to a bitter controversy between the planters and the ministers. The clergy appealed to the king, and the oppressive act was declared void. This brought down upon the clergy almost universal denunciation, the more so because in many instances they had sued for the losses suffered under the illegal act. A test case was heard in Hanover county, and the court decided in favor of the ministers. The trial was crowded, more than 20 of the clergy being on the bench, Patrick's father acting as presiding justice, while a distinguished lawyer stated the case for the plaintiffs. Patrick, upon rising to speak for the other side, commenced a rambling and uninteresting address. The clergy smiled in anticipative triumph, but suddenly his diffidence passed away, a strange change came over him; as a contemporary says, "a mysterious and almost supernatural transformation of appearance;" his form expanded, and the force of his speech "made their blood run cold and their hair rise on end." The ministers left their bench under his withering invective; the jury without hesitation gave a nominal verdict of one penny damages. The excitement was so intense that the audience seized the young orator and bore him in triumph on their shoulders, and thus, at one bound, Patrick Henry rose to the front rank of American orators. There was no lack of clients thereafter, and his prosperity was assured. But he was not satisfied with his legal profession. In 1765 he became a member of the house of burgesses. At the critical period of the stamp act debate, Henry was comparatively unknown to the assembly, and the rich planters were scandalized at his presumption in offering to address the house upon so important a subject. Henry hastily wrote brief resolutions which set forth that the burgesses and the governor had the exclusive right and power to lay taxes and imposts upon the people of this colony, and that not alone the stamp act, but all acts of parliament affecting the rights of the colonies were unconstitutional and therefore void. A storm of opposition followed; the resolutions were denounced as extreme, impolitic, and dangerous. Henry writes: "Many threats were uttered, and much abuse was cast on me by those who wished submission." Thomas Jefferson attested that "the debate was most bloody." But Henry would not yield. In the debate he startled even the patriots by exclaiming: "Cæsar had his Brutus, Charles the first his Cromwell, and George the third"—here he was interrupted by the presiding officer and members with cries of "Treason! treason!"—"may profit by their example," calmly said the orator, completing the sentence, adding, "If this be treason, make the most of it." The resolutions were adopted by a majority of one. He was now a power in the colony, and replaced the vacillating planters in the leadership. He became the authorized representative of the people against the aristocracy. He rose to higher public duties when the stamp act was repealed, other burdens were laid upon the colonies in the form of duties upon tea and other necessary articles. The opposition to such imposts shown by Henry, Jefferson, and the Lees, brought about the dissolution of the house of burgesses by lord Botetourt, the royal governor. Henry was the leader in preparing the articles of an association to discourage the use of British merchandise. He continued his legal business, and, though wanting in legal education, was wonderfully successful before juries. With Jefferson and others he was ready to precipitate an open rupture with England. In 1773, Henry, Jefferson, Dabney Carr, and the two Lees, originated the committee of correspondence, whose duty it was to spread intelligence among the colonies. Dunmore was then governor, and he at once dissolved the burgesses, who were at once re-elected by the people, and early in 1774 they met again. In Boston the tea had been thrown into the sea, and a collision was to be expected at any moment. The burgesses appointed a day of fasting and prayer, and for this Dunmore again dissolved the body. Then the burgesses convoked an assembly to be chosen by the people, to meet at Williamsburg, Aug. 1, 1774. That body adopted a non-importation agreement, and appointed delegates to a congress to meet at Philadelphia. Henry was one of the delegates, and in that famous assembly he was hailed as the champion of constitutional liberty, and his wonderful eloquence was at once recognized. The main result of the congress was to send a petition to the king, and an address to the people of the mother country. In Mar., 1775, a convention met at Richmond, of which Henry was the moving spirit. His resolutions to organize the militia

and put the colony in an attitude of defense met with great opposition. He replied in a burning speech in which occur the memorable words: "There is no retreat but in submission and slavery. Our chains are already forged. Their clanking may be heard in the plains of Boston. The next gale that sweeps from the north will bring the clash of resounding arms. I know not what course others may take, but, as for me, give me liberty or give me death!" Without an opposing voice the resolutions were adopted, and very soon afterwards came the news of the battle at Lexington and Concord. Virginia was ripe for revolt. Dunmore knew this, and privately took away all the powder in the colony. The people took up arms; they were told that the powder would be returned, and 700 men at once disbanded. Henry seized the favorable moment, gathered a force of militia, and marched upon Williamsburg to arrest the royal receiver-general. An agent of Dunmore's met him, and paid him £330 for the powder. Henry was denounced for stirring up sedition, but it was too late to talk of loyalty; the province was aroused, and in June Dunmore took refuge on a man-of-war. A convention assembled at Richmond and appointed a committee of public safety with most extensive powers. Two regiments were raised, and Henry was appointed commander of all the forces to be raised. The first collision was at Great Bridge, where the Virginia militia gained a triumph over drilled British troops, and drove Dunmore back to his ship. Henry should naturally have been the leader of the troops, but the active command was given to col. William Woodford. Henry was disappointed, and resigned. In the convention of May, 1776, when the delegates to the Philadelphia congress were instructed to demand the independence of the colonies, he took an active part. In that year he was chosen governor of Virginia, and was re-elected until 1779, when he was not legally eligible. He returned to the legislature in which he served through the war, and was then once more chosen governor, serving until 1786, when he finally resigned. In 1788 he was a member of the convention to ratify the federal constitution, which he vigorously opposed, chiefly on the ground that it would tend to supersede state rights. In 1795 Washington offered him the position of secretary of state, but he declined. He also declined Adams's offer of the French mission, and a nomination as governor in 1796. He was elected to the state senate in 1799, but did not live to take his seat, dying June 6 of that year.

HENRY, PHILIP, 1631-96; b. London; educated at Westminster and ordained in 1657. He was one of the clergymen who left the English church in 1662 in consequence of the act of uniformity. For 25 years he maintained silence, but in 1687 was permitted to preach after the king's declaration of liberty of conscience, and occupied the pulpit until his death.

HENRYSON, ROBERT, 1425-1506; an early Scottish poet and author of the first specimen of the pastoral poetry of his country; according to tradition the ancestor of the family of Henryson or Henderson of Fordell, in the county of Fife, one of whom, James Henderson, was king's advocate and justice-clerk in 1494. From various circumstances known about him he must have been born about the year 1425. He seems to have been educated abroad, as his name does not appear in the registers of the university of St. Andrews, the only one then existing in Scotland; and from an allusion in one of his poems, his attention was probably given to the study of law. In 1462 his name appears in the list of members of the newly founded university of Glasgow as "Magister Robertus Henrysone in artibus licentiatu et in decretis Bachalarius." Henryson seems, in addition to teaching, to have practiced at Dunfermline, as a notary public. His decease in or shortly before 1506 is alluded to by Dunbar. Of the writings of Henryson that have come down to the present time his *Testament of Cresseide* may be considered the chief. It was composed as a continuation or supplement to Chaucer's *Troilus and Cresseide* which was one of the most popular poems in the English language. Henryson resumes the story where Chaucer leaves off, and completes it by inflicting a suitable punishment on the false Cresseide. This continuation displays so much skill that it has been included in all the early editions of Chaucer, as if it had been the work of that poet himself. Another poem, *Robene and Makynne*, though short, is remarkable as the first known specimen of pastoral poetry in the Scottish language, while his *Budy Serk*, is amongst the oldest examples of ballad poetry. His metrical version of 13 of the *Fables of Æsop*, is perhaps the best known of his works. To each fable is appended an application or moral. In these he alludes to the oppressions of the people and the unsettled state of the country during the feeble reign of James III.

HENSHAW, JOHN PRENTISS KEWLEY, D.D.; 1792-1852; b. Conn., and graduated at Middlebury (Vt.) college in 1808. From a Congregationalist he became an Episcopalian; preached a number of years in Brooklyn, N. Y., and went to Baltimore in 1817, where he was 26 years rector of St. Peter's church. In 1843 he was bishop of Rhode Island. Among his works are *Theology for the People*, *Inquiry Concerning the Second Advent*, and *Lectures on Terms used in the Prayer Book*.

HENSLER, ELISE, b. Switzerland, 1835. At five years of age the family removed to the United States, and became residents of Boston. The child early showed considerable talent as a vocalist, and was sent, when about 15 years old to Milan to study, through the liberality of certain citizens of Boston. She made her *début* in *La Scia* in 1854, with success, and in 1855 supported Mme. La Grange at the academy of music

in New York, where she became a favorite. She continued to sing in this country and in Europe, until, in 1868, having attracted the attention of Dom Fernando, ex-king of Portugal, they were married June 10, 1869, Miss Hensler receiving the title countess d'Edla, under which she was espoused.

HENTZ, CAROLINE LEE, 1800-56; b. Mass., maiden name Whiting; married 1825 N. M. Hentz, who became a professor in Chapel Hill college, N. C. She afterwards removed to Kentucky, where she became known as a writer. Her first publication was *De Lara or the Moorish Bride*, a play, for which she received a prize. Her life was passed in several of the southern states. Among her books are nearly a dozen stories which were very popular. Perhaps the best known was *The Mob Cup*.

HEPHAESTION, son of Amyntor, a Macedonian of Pella and friend of Alexander the great. The two were companions in childhood, but beyond this connection we find no evidence of such qualities in Hephæstion as deserved the passionate attachment of Alexander. The king seems never to have been blind to his real character, and to have made a marked distinction between him, as the friend of his private life and his leisure hours, and such men as Craterus whom he could intrust with important enterprises. We do not hear of Hephæstion till 334 B. C., when he accompanied the king on his visit to Troy. Many tales are told of the close intimacy existing between them; for example, when a letter of very delicate and private nature from Olympias was handed Alexander, Hephæstion according to his custom was reading it over his shoulder, when Alexander without uttering a word took his ring off his finger and pressed it on his friend's lips. In the later campaigns of Alexander in Bactria and India, we find Hephæstion charged with important commands. He was rewarded with a golden crown and the hand of Drypetis, the daughter of Darius and sister of Alexander's own wife Statira (324 B. C.). In the end of the same year he died very suddenly at Ecbatana. Alexander tried to relieve his grief by paying the most extravagant honors to his friend. A general mourning was ordered over Asia; at Babylon a funeral pile was erected at a cost of 10,000 talents; and temples were erected to him as a hero.

HEPTANOMIS, a name given by the Greeks to the interior of Egypt from 30° to 27° N., which comprised nearly all the greatest Egyptian cities and monuments.

HEPWORTH, GEORGE HUGHES, b. Boston, 1833; graduated at Harvard theological school, and became a Unitarian preacher in Nantucket. In 1858 he was pastor of a Boston church; in 1862 chaplain of the union army; 1863 on gen. Banks's staff in Louisiana. After the war (1870) he took charge of the church of the Messiah in New York, but resigned within two years, renouncing the Unitarian faith, and soon afterwards he established in the same city the Congregational church of the Disciples. He resigned this charge in 1878, and went abroad for rest, and to recruit his wasted health. He has been distinguished as a popular lecturer, and is the author of some published volumes, among which are *Whip, Hoe, and Sword*, and *Rocks and Shoals*.

HERACLEA, a city of Bithynia (now Ereğli in Amadolia) on the S. coast of the Black sea, having a good harbor and considerable trade. In the time of Alexander the great it rose to great prosperity, but in the Roman war against Mithridates it was nearly destroyed. (See Ereğli.)

HERACLEA, a city of Sicily, at the mouth of the Halycus (the modern Platani), not far from the promontory now known as cape Bianco. It is distinguished from other Heracleas by the surname of Minoa, which is explained as referring to its foundation by Minos of Crete. Its name frequently occurs in connection with the Carthaginian occupation of Sicily, and it was in the neighboring sea that the Carthaginian fleet was routed by Regulus and Manlius, 256 B. C. The Romans introduced a colony.

HERACLEONITES, called after Heracleon, a Gnostic who flourished 125 A. D. in s. Italy or Sicily. In his system he appears to have regarded the divine nature as a vast abyss in whose *pleroma* were æons of different orders and degrees,—emanations from the source of being. Midway between the supreme God and the material world was Demiurgus, who created the latter, and under whose jurisdiction the lower animal soul of man proceeded after death, while his higher celestial soul returned to the *pleroma* whence it first issued. Heracleon seems to have received the ordinary Christian scriptures; and Origen has preserved fragments of a commentary by him on St. John's gospel, while Clement of Alexandria quotes from him what appears to be a passage from a commentary on St. Luke's gospel. These writings are remarkable for their intensely mystical and allegorical interpretations of the text.

HERACLES. See HERCULES, *ante*.

HERACLIDES, PONTICUS, a Greek author of the 4th c. B. C., said to have been a disciple of Plato and Aristotle. According to Suidas, the former of these philosophers, on departing for Sicily left his scholars in the charge of Heracles. The latter part of his life was spent at Heraclea. He is said to have been vain and fat, and to have maintained such state in Athens that the wits changed his name into Pompicus, or the Showy. On one occasion Heraclea was afflicted with famine, and the pythoness at Delphi, bribed by Heracles, assured his inquiring townsmen that the dearth would be stayed if they granted a crown to that philosopher. This was done; but just as Heracles was receiv-

ing his honor in a crowded assembly he was seized with apoplexy, while the dishonest priestess perished from the bite of a serpent. On his death-bed he is said to have requested a friend to hide his body as soon as life was extinct, and, by putting a serpent in its place, induce his townsmen to suppose that he had been carried up to heaven. The trick was discovered, and Heraclides received only ridicule instead of divine honors.

HERBERT, HENRY WILLIAM, 1807-58; b. London; the son of the dean of Manchester; graduated at Cambridge; emigrated to New York in 1831, and for eight years taught Greek in a private school. He was for three years (1833-36) editor of the *American Monthly Magazine*. In 1834 he began to publish works of fiction, of which seven or more appeared within 20 years. He wrote also a number of historical works; but his forte was as a writer on field-sports, on which subject, under the name of "Frank Forrester," he was without a rival. His works were very popular and are still in high repute. He was also an industrious editor, and a constant writer for magazines and newspapers.

HERBERT, JOHN ROGERS, b. England, 1810; studied in the royal academy and became a portrait and general painter. He was employed on the decoration of the houses of parliament, where he painted several frescos illustrating justice and its development in law and judgment. He is a member of the royal academy.

HERBERT, Sir THOMAS, 1606-82; an English traveler and author. He was in the suite of sir Dodmore Cotton, who was about to leave as ambassador for Persia in company with sir Robert Shirley. Sailing in March, 1627, they visited the cape, Madagascar, Goa, and Surat; having landed at Gombroon, they traveled inland to Asharoff, and thence to Cazbeen, where both the chiefs of the expedition died. Herbert reached England again in 1629, and in 1630, to his great disappointment, his patron the earl of Pembroke died suddenly. After this he traveled on the continent for more than a year. From his return in 1631 till about two years after his marriage in 1632 he retained his ambition for court favor, but failing in this he retired, probably to his estate of Tintern in Monmouthshire, till the outbreak of the civil war, when he sided with the parliament. In 1646 he was appointed to attend the king with his other servants. Becoming a devoted royalist, he continued with his majesty during the last two eventful years of his life, and at the restoration he was rewarded with the title of baronet. He resided at Westminster till the great plague, when he returned to York and bought Petergate house, where he died.

HERBIVORA, Lat. *plant-eaters*, an order of ungulate or hoofed mammals, which feed wholly upon vegetable food, using their limbs for support and locomotion only. The animals in this order have been differently classified by different naturalists. Cuvier divided them into two orders, the *pachydermata* and *ruminantia*. The *pachydermata* comprises the thick-skinned herb-eaters, as the elephant, rhinoceros, tapir, hog, hippopotamus, horse, and others. In the *ruminantia*, or cud-chewers, he placed the deer, the antelope, the sheep, the ox, and like animals. If Cuvier's orders are placed in one, then the herbivora will contain the suborders *proboscideans* (elephants), *tapiridians*, having long noses, but not prehensile or only very slightly so, as in the rhinoceros and tapir; the *suidians*, having long but not at all prehensile snouts, as the hog and the hippopotamus; the *solipedes*, or those having one toe only to each foot, and the *ruminants*, or the cud-chewers, having cloven hoofs. Agassiz, in his classification, placed the herbivora with the marsupials and carnivora as the three orders of the eighth class. This classification is not generally followed.

HEREROLAND, a region of s.w. Africa stretching n. from the Kuisip to the Cunene; 100,000 sq. m.: pop. 184,000, of whom but 300 are whites. Hereroland has a coast of 460 m., but the only point where it offers shelter and access to ships is Walfish bay, a safe but comparatively shallow harbor formed by Pelican point immediately to the s. of the mouth of the Kuisip. The country consists of three distinct physical regions: first, a long and narrow coast district backed by a very regular line of hills, of which the highest point appears to be Mt. Messum or Dourissa; secondly, a broad mountainous tract; and thirdly, a steppe region which stretches away into the Kalabari desert. The rivers are mere wadies which only at intervals succeed in bringing water as far as the sea. Except in the half-dry river-beds, the coast district is almost destitute of vegetation, the only edible fruit being the *nara*, which grows on the sand-dunes, and is, according to Anderson, eaten by oxen, mice, men, ostriches, and llons. In the mountainous tract there are places of considerable fertility; large trees, as sycamores, etc., grow along the river-beds, and euphorbias, tamarisks, and a variety of strong-spined bushes prevail. In a few favored spots wheat can be cultivated, and from a single grain as many as 150 stalks may be produced. The coast range and many of the mountains are composed of granite and gneiss, broken by intrusive quartz and porphyry; further e. limestone formations, both carboniferous and oolitic, are predominant; and these again give place to sandstone strata, worn by the weather into table-shaped eminences. The granite and gneiss are being disintegrated with great rapidity. Both iron and copper are said to occur in considerable abundance, though the mineral exploitation of the country has had no satisfactory result. About 25 mineral springs, both hot and cold, are known to exist among the mountains.

HERETICS, (*HERESY, ante*). *First century*: Simonians (so called from Simon Magus) Cerinthians (Cerinthus) Ebionites (Ebion) and Nicolaitans (Nicholas, deacon of Antioch). *Second century*: Basilidians (Basilides), Carpocratians (Carpocrates), Valentinians (Valentinus), Gnostics (Knowing Ones), Nazarenes, Millenarians, Cainites (Cain), Sethians (Seth), Quartodecimans (who kept Easter on the 14th day of the 1st month), Cerdonians (Cerdon), Marcionites (Marcion), Montanists (Montanus), Tatianists (Tatian), Alogians (who denied the "Word"), Artotyrites, and Angelics (who worshiped angels). *Third century*: Patripassians, Arabici, Aquarians, Novatians, Origenists (followers of Origen), Melchisedecians (who believed Melchisedec was the Messiah), Sabellians (from Sabellius), Manicheans (followers of Mani). *Fourth century*: Arians (from Arius), Colluthians (Colluthus), Macedonians, Agoetae, Appollinarians (Appollinaris), Timotheans (Timothy the apostle), Collyridians (who offered cakes to the Virgin Mary), Seleucians (Seleucus), Priscillians (Priscillian), Anthropomorphites (who ascribed to God a human form), Iovinianists (Iovinian), Messalians, Bonosians (Bonosus). *Fifth century*: Pelagians (Pelagius), Nestorians (Nestorius), Eutychiens (Eutychius), Theo-paschites (who said all the three persons of the Trinity suffered on the cross). *Sixth century*: Predestinarians, Incorruptibles (who maintained that the body of Christ was incorruptible), New Agnoetae (who maintained that Christ did not know when the day of judgment would take place), Monothelites (who maintained that Christ had in his two natures but one will).

HERING, CONSTANTIN, b. Saxony, 1800; studied medicine in Germany, and accompanied Wiegell, the botanist, on his scientific expedition to French Guiana. About 1834 he settled in Philadelphia, where he soon became favorably known as a homeopathic physician. Among his works are *Rise and Progress of Homoeopathy*, *The Domestic Physician*, and various essays.

HERISAU, the largest t. in the Swiss half-canton of Appenzel-ausser-Rhoden, at the confluence of the Glatt and Brühlbach, 7 m. n.w. of Appenzel, and 2,550 ft. above sea-level. The town is irregularly built, and extends over a large area. The church-tower, in which the archives are kept, is referred to the 7th century. Herisau has a public library, an arsenal, a new town-house, and a hospital, and is the seat of the cantonal council and of a district court of justice. The manufactures comprise muslin, cotton, and silk. Christianity was introduced at Herisau (a name during the middle ages Latinized as *Augia Domini*) about the beginning of the 7th century. The nobles of Herisau were its first superiors, but their power passed in 1390 into the hands of the abbots of St. Gall, from whose somewhat oppressive rule the people bought themselves free in 1463. In the neighborhood beautiful walks lead to the interesting ruins of the castles of Rosenberg and Rosenburg. The baths and goat's-why cure of Heinrichsbad are about a mile to the north-east.

HERKIMER, a co. in e. central New York, on the Mohawk river, intersected by the Erie canal and the New York Central railroad; 1400 sq.m.; pop. '75, 41,586. The surface is generally hilly, rising in the n. part into a spur of the Adirondack mountains. The soil, especially along the Mohawk valley, is very fertile. Chief productions: cheese, butter, hay, broom-corn, potatoes, and cattle. Co. seat, Herkimer.

HERKIMER, NICHOLAS, 1720-77; b. N. Y.; son of J. J. Erghemar, whose name became corrupted to Herkimer, a German emigrant. Nicholas commanded at Fort Herkimer in 1758 when an attack was made by the French and Indians. In the war of the revolution he was a colonel and led a force to the relief of Fort Stanwix. In Aug., 1777, he was wounded in a skirmish with the Indians, and died from the effects of amputation. Congress voted a monument to him, but it was never built.

HERMANN, FRIEDRICH BENEDICT WILHELM VON (1795-1868). A distinguished political economist, b. Bavaria; studied at the universities of Erlangen and Würzburg. His attention was directed to mathematics and political economy, and in 1817 he opened a private school at Nuremberg. In 1823 he became *privat dozent* at the university of Erlangen, and a few years later was professor of mathematics at Nuremberg. His great work, *Staatswirthschaftliche Untersuchungen* (Economic Researches), appeared in 1832, and three years later he was made member of the royal Bavarian academy of science. His life was a succession of active and energetic service. He was inspector of technical instruction in Bavaria; in 1839 assumed charge of the bureau of statistics; in 1845 was one of the councilors of the interior; and in 1848 sat as member for Munich in the national assembly at Frankfurt, where he was instrumental in organizing the so-called "great German party," and representative of their views at Vienna. In 1855 he attained the highest honor to which he could aspire, and became councilor of state. He published a large number of reviews and papers in the various German newspapers, and as head of the bureau of statistics he published a yearly report of high value.

HERMAPHRODITE BRIG, or BRIGANTINE. See *BRIG, ante*.

HERMIAS, a slave of Eubulus, tyrant of Atarneus, Asia Minor, and succeeded him on the throne in 347 B.C. He was a favorite of Eubulus, and was treated as a freeman, being permitted to go to Athens where he made the acquaintance of Plato and Aristotle. The latter spent some years at Hermias's court, but fled when Artaxerxes captured

Hermias, who was put to death. The philosopher erected a statue in his honor and married one of his relatives.

HERMOGENES, of Tarsus, a Greek rhetorician, who flourished in the reign of Marcus Aurelius. His precocious ability secured him a public appointment as teacher of his art while as yet he was only a boy; but at the age of 25 his faculties gave way, and he spent the long remainder of his life in a state of intellectual impotency. In the nine or ten years, however, of his activity, he composed a whole series of treatises on rhetoric, which became popular text-books, and the subject of subsequent commentaries.

HERMON, one of the highest mountains in Syria (9,150 ft. above the Mediterranean), an outlier of the Anti-Lebanon. The Sidonians call it Sirion, and the Amorites Shenir. Some part of this mountain near Cæsarea Philippi was probably the scene of the Transfiguration. The modern name is *Jebel esh Sheikh*, or "chief mountain." It is also called *Jebel eth Thelj*, "snowy mountain." The ridge of Hermon, rising into a dome-shaped summit, is 20 m. long, extending n.e. and s.w. The formation is a hard, dark-gray crystalline limestone belonging to the Neocomian period, and full of fossils. The spurs consist in some cases of white chalk covering the limestone and on the s. there are several basaltic outbreaks. The mountain in spring is covered with snow, but in autumn there is occasionally none even in the ravines. To the height of 500 ft. it is clothed with oaks and brush, while luxuriant vineyards abound. Above the snow limit the mountain is bare and covered with fine limestone shingles. The summit is a plateau from which three knolls rise up, that on the w. being the lowest and that on the s.e. the highest. On the s. slope of the latter are the remains of a small temple described by St. Jerome. The view from Hermon is very extensive, embracing Lebanon and the plains e. of Damascus, to the n. and e., while to the s. there is an uninterrupted view of Palestine as far as Carmel and Tabor. On a clear day even Jaffa may be seen. Several small temples are found on the sides of Hermon, of which twelve in all have been explored. They face the e. and are dated by architects about 200 A.D. Foxes, wolves, and the Syrian bear are commonly found on Hermon, with various kinds of game.

HERMOPOLIS MAGNA (now Eshmoon or Ashmounen), a city of Heptanomis, or Middle Egypt, on the Nile. Owing to its frontier position with reference to Middle and Upper Egypt, the ancient Hermopolis was a place of importance, second only to Thebes. The portico, still remaining, of a magnificent temple has attracted the notice of travelers. It consists of twelve pillars each 40 ft. high, in two rows of six to each row, painted with bands of blue, red, and yellow. These pillars are composed of irregular masses fitted together—a peculiarity of extremely rare occurrence in Egyptian architecture. The ruins of Hermopolis have been greatly destroyed by the Mohammedans, who have used them for building purposes.

HERNANDO, a co. in w. Florida, on the gulf of Mexico and the Withlacoochee river; 1950 sq. m.; pop. '70, 2,938—854 colored. It is level, and largely covered with forests. The soil is sandy. Chief productions: corn, cotton, sugar, rice, etc. Co. seat, Brooksville.

HERNDON, WILLIAM LEWIS, 1813—57; b. Va.; entered the navy at 15; served in the war with Mexico, and was for several years in the naval observatory. In 1851 he conducted an exploring expedition on the Amazon at the instance of the U.S. government, starting from Lima and crossing the Andes. In 1857 he was lost at sea while commanding the steamship *Central America* on her voyage from Havana to New York. Nearly all the women and children were saved, but Herndon and 426 others were lost.

HERNÖSAND, chief t. and seat of justice of Wester Norrland, on the e. coast of Sweden, built on the island of Hernö (connected with the mainland by bridges), about 3 m. s. of the mouth of the Angerman river, and 230 m. n. of Stockholm; pop. '76, 4,912. It is the seat of a bishop, and possesses a fine church erected in 1842—46. There are engine-works, timber-yards, saw-mills, and various manufactories in the town. The harbor is good. In 1878, 33 vessels, chiefly engaged in the timber trade, with a total burden of 7,698 tons, entered and cleared at the port. Tar is also exported, and there is an establishment for pisciculture in the town. Hernösand was founded in 1584, and received its town privileges from John III. in 1587.

HERO'DES ATTICUS. See ATTICUS HERODES.

HERODIAN, author of a Greek history extending from 180 to 238 A.D. It narrates the events of the 58 years that intervened between the death of Marcus Aurelius and the proclamation of Gordianus III. The narrative is of special value for the reigns of the emperors subsequent to Alexander Severus, with whom the work of Dion Cassius ends. As a historian, Herodian has prominent merits and defects. His work has the value that attaches to a record written by one chronicling the events of his own times, gifted with respectable powers of observation, indubitable candor, and independence of view. But he prefers style to truth, and is thus led into exaggerations and errors. The inner life and thought of Rome, the formidable barbarian pressure on her borders, are alike unheeded, that he may blazon his pages with the dazzling vicissitudes of the purple. Though the declamations which he introduces are apt to become tedious, his story is on the whole clear, graceful, and vivacious. The frequent antitheses and studied tricks of phrase save the rhetorical schools. Imitations of Thucydides and

Latinisms are frequent. Yet in the main his style retains an original cast, a genuine un-borrowed beauty, and contrasts favorably with the thin, affected Atticism of the period.

HERODIANS, a sect among the Jews, as to whose particular tenets there have been many opinions. Probably they were political in aim, and supported Herod Antipas in his claims to regal power. In New Testament history we generally find them opposed to the Pharisees, or hierarchical party.

HEROLD, LOUIS JOSEPH FERDINAND; 1791-1833; b. France; a composer who studied with Adam and Cherubini, and successfully competed for the conservatory prizes. He spent five years in Italy, and upon his return composed several successful but ephemeral pieces for the *opéra comique*. *Zampa* is his best-known production. It was followed by the *Pré au Cleres*, also much admired. His health was seriously affected by the assiduity of his studies, and he died in the prime of life.

HERPETOLOGY (*ante*). See **BATRACHIA** and **REPTILES**, *ante*.

HERPETON TENTACULATUS, a snake found in tropical regions which has scale-covered appendages attached to the mouth, the uses of which are at present unknown.

HERRING, JOHN FREDERICK, 1795-1865; b. England, the son of an American. The boy had a passion for painting horses, and for many years executed the portraits of the winners of races. He was a great expert in drawing other animals, fowls, etc. One of his best known works is "Three Members of the Temperance Society," representing three horses drinking at a fountain.

HERRING FISHERY (*ante*) in America is an industry of great importance, rivaled in value only by the cod and seal fisheries. From seven and a half to ten millions of pounds, valued at from \$200,000 to \$300,000, are brought into market in the United States, besides immense quantities consumed while fresh. The chief fishing port is Gloucester, Mass., although other ports do a large business. The vessels go northward to the coast of Maine, Nova Scotia, New Brunswick, the Magdalen island, Newfoundland, and Labrador, in spring and early winter. In winter the fish are frozen and sent in that condition to market. This fishery is of great importance to the Eastern states and the Dominion of Canada, and the herring as well as the cod was among the subjects that brought about the British-American fishery commission of 1877.

HERRON, FRANCIS JAY, b. Penn. 1837; graduated at the Western university; entered the union army as captain in 1861, and was engaged in several battles, and seriously wounded at Pea Ridge. In May, 1865, he received the surrender of the confederate forces west of the Mississippi. In 1872 he was secretary of the state of Louisiana.

HERTFORD, a co. in n.e. North Carolina on the Virginia border and the Chowan river; 320 sq.m.; pop. '70, 9,273-4,952 colored. The surface is hilly, and much of it is covered with forests. Chief productions: cotton, corn, and pork. Co. seat, Winton.

HERTHA, **HERTHUS** or **ÆRTHA**, a deity of the ancient Germans. Her name is doubtless the root of the modern English *earth*, and the German *erde*. Tacitus states that she was worshiped with great solemnity by the Suevi, and that her temple stood in an island of the ocean, where her service was performed by a single priest. On great occasions which were regulated by this priest, the covered chariot of the goddess was drawn forth from the sanctuary by sacred cows and led in triumph throughout the country. Those districts through which the chariot passed were held to be peculiarly favored; peace was always proclaimed, and the occasion celebrated by universal merry-making, until the priest declared that it was the will of the goddess to return to her shrine. Her image was then washed in a sacred spring, and all who witnessed the ceremony of the ablution were drowned. The island of Rugen was long thought to be identical with the sacred island of Hertha, but the same honor has been claimed for Heligoland and Zetland.

HERULI, **ÆRULI**, or **ERULI**, a nomadic and warlike German tribe, who inhabited the n. shores of the Black sea, but afterwards divided into sections and wandered into different parts of Europe. They first appear in history in the 3d c., as taking part with the Goths in their excursions against the eastern provinces of the Roman empire. In the 4th c. they acknowledged the supremacy of the Gothic king Ermanric, but when Attila, king of the Huns, made his descent upon Gaul, they joined his standard. After the overthrow of the Huns, in which they suffered considerably, they established an organized and distinct confederacy on the banks of the Danube, and under the leadership of Odoacer, assisted in 476 in the overthrow of the Western empire. Under their king Rudolph they, in the beginning of the 6th c., attempted the subjugation of the Longobardi, but were defeated and dispersed, some of them proceeding to Scandinavia, and others being allowed by the emperor Anastasius to settle on the s. bank of the Danube. In the time of Justinian some of them embraced Christianity. A large portion of them afterwards joined the Gepidae in their wars against the Eastern empire; but others fought with Justinian against the Vandals and East Goths. Towards the end of the 6th c. they became merged in other nations, and disappear from historical records. The Heruli were bold, hardy, and extremely pugnacious. For a considerable period

they retained their strong individuality, and presented a firm resistance to the influences of surrounding civilizations. They are said to have offered human sacrifices.

HERVÉ (name assumed by Florimond Ronger), b. France, 1825: widely known as a composer of operatic music. *Don Quixote*, the first opera bouffe on the Parisian stage, was produced in 1847. Among his productions are *The Turks*, *Little Faust*, *Chilperic*, etc.

HERVEY, JAMES, 1714-58; b. England; educated at Northampton grammar school and Oxford university, where he came under the influence of John Wesley, and for some time manifested an inclination towards his theological opinions; but ultimately he adopted a thoroughly Calvinistic creed, and resolved to retain his connection with the established church. Having taken holy orders in 1737 he became curate to his father, and succeeded him in 1752. Laboring under the disadvantage of very weak health, he discharged his parochial duties conscientiously, and wrote works which, while of slight literary or theological value, rapidly became popular, and in many English and Scottish houses, especially of the humbler class, ranked with the *Pilgrim's Progress* and the *Whole Duty of Man*. His earliest work, *Meditations and Contemplations*, comprising *Meditations Among the Tombs*, *Reflections in a Flower Garden*, a *Descent on Creation*, and *Contemplation on the Night and Starry Heavens*, passed through 14 editions in as many years. *Theron and Aspasio*, which was equally well received, called forth some adverse criticism, even from the Calvinists, on account of tendencies which were considered to lead to Antinomianism, and was strongly objected to by Wesley. It was influential in spreading in England the theological disputes to which Fisher's *Murvon of Modern Divinity* had given rise in Scotland, led to what is known as the Sandemanian controversy as to the nature of saving faith.

HERVEY, JOHN, Baron Hervey of Ickworth, 1696-1743; the *Narcissus*, *Sporus*, and *Lord Fanny*, in Pope's satires, a nobleman of political and social distinction in the reign of George II., son of John, first earl of Bristol. Educated and trained for public life at Westminster and Clare Hall, Cambridge, he became a favorite at the court of the prince and princess (afterwards George II. and queen Caroline), to which Pope, Gay, Arbuthnot, Chesterfield, and other wits resorted, and which was celebrated for the beauty and accomplishments of its ladies. Hervey married Miss Lepell 1720. Having entered the house of commons as member for Bury, he was made vice-chamberlain to the king in 1730, and in 1733 sir Robert Walpole called him up to the house of lords, where he proved an effective speaker. In 1740 he succeeded lord Godolphin as lord privy seal, which office he held until the Walpole administration was driven from power, 1742. Notwithstanding his miserable health he continued to take an active part in politics until his death. He was survived by his four sons, three of whom were successively earls of Bristol. Destitute of any commanding talents or solid principle, a skeptic in religion, and a profligate in morals, lord Hervey was yet far above the intellectual rank assigned him by Pope. He was a vigorous writer and speaker, a fair scholar, and the author of some pleasing verses.

HERWARTH VON BITTENFELD, KARL EBERHARD, b. Saxony, 1796; began his military life in 1811, and served in the field against Napoleon in 1814. He rose by successive grades, to be gen. of infantry. In 1864 he commanded the Prussian troops against Denmark, and June 29 captured the island of Alsén. In 1865 he commanded the 8th army corps; the following year he was appointed commander-in-chief of the army of the Elbe, and was conspicuous in several engagements. During the Franco-German war he was governor-general on the Rhine. He retired from service in 1871.

HERZ, HENRIETTE, 1764-1847; b. Berlin; the daughter of a physician, who at 16 became the wife of Markus Herz, a rich and elderly citizen, and by reason of her rare beauty and superior intellectual attainments soon became a social leader. Schleiermacher and the Humboldts were among her intimate friends. She was left a widow in 1803, but maintained her position in society and kept up her relations to literary people during her whole life.

HESE, ADOLPH FRIEDRICH, 1809-63; b. Germany; was the son of an organ maker. When but 9 years old, Adolph played so well on the organ as to astonish all who heard him, and in 1827 he was appointed assistant player in a church in Breslau, and in 1828-29 traveled over Germany giving concerts. He left about 80 compositions, including an oratorio, symphonies, and overtures.

HESSIAN FLY (*ante*). The eggs are laid on the young blades of the wheat, after the coming up of the plant in the fall, and also in the spring. The eggs are about $\frac{1}{60}$ of an inch long, with a diameter of only $\frac{1}{100.00}$ of an inch, of a pale red color, and hatch in four or five days, if the weather be warm. The larvæ, as soon as hatched, descend between the leaf and the stalk till they reach a joint, just below the surface of the ground, at that stage of the plant's growth. Here they undergo their metamorphoses, being nourished by sucking the juices of the plant. All the transformations may require several months, sometimes a year, being often retarded by circumstances. It needs but very few of these insects to cause the plant to wither and perish. The larvæ attain their full size in five or six weeks when they are $\frac{1}{2}$ of an inch long, and have the appearance of a flax seed. In April and May the fly is released and soon begins to lay its eggs on the young wheat blades, of both autumn and spring sowing. The eggs attain the

pupa state (flaxseed appearance) in June and July, the fly appearing in the autumn to lay the eggs for the next spring brood. Many of these do not come to maturity till after harvest, remaining for a time in the stubble in the pupa state. The Hessian fly is said to have been first seen in this country on Staten Island in 1776 near the place where sir William Howe disembarked the Hessian soldiers under his command; and from this circumstance received its name. The progress of the insect seems to have been about 20 m. in a year, usually migrating in swarms. It is a difficult pest to get rid of, and the eradication requires concert of action among the farmers. If the straw contain any insects in the pupa state it should be burned. The stubble should be cut quite long so as to give as much heat as possible when it is burned. Then plowing, and careful harrowing and collecting of the roots as far as practicable should follow, with drying, and burning. See *Insects Injurious to Vegetation*, by Dr. T. M. Harris.

HESTIA, a goddess of Greece, supposed to have been the latest in origin of the greater deities. She appears to belong to a particular stage in the advancement of civilization, and to embody the religious sanction that confirmed the social system then reached. The fact that Hestia is not mentioned in Homer shows that her worship was not then so universally acknowledged. Perhaps we may see in the connection of the Latin Jupiter and Vesta at Lavinium a relic of the worship of this same goddess under the same name (they are only two forms of the feminine of the passive participle of the root *ves*, burn), and an evidence of the connection between the two races. We find therefore in Hestia relics of the old pre-Greek worship; she is the altar-fire, presiding over all sacrifices, and sharing the honors of all the gods. The opening sacrifice was offered to Hestia; to her at the sacrificial meal the first and last libations were poured. The fire of Hestia was always kept burning, or if by any mischance it were extinguished, only sacred fire produced by friction, or directly obtained from the sun, might be used to rekindle it. But beyond this she is the goddess of family union, the personification of the idea of home, the protectress along with Zeus of the suppliants who fled for refuge to the hearth. To her therefore is ascribed the art of housebuilding. Hestia and Hermes are often united as the representatives of home and private life on the one hand, and of business and outdoor life on the other. The city union, moreover, is just the family union on a large scale; it has its center in the prytaneum, where the common hearth-fire round which the magistrates meet is always burning, and where the sacred rites that sanctify the concord of city life are performed. From this fire, as the representative of the life of the city, was taken the fire wherewith that on the hearth of a new colony was kindled. Even larger unions than the city had their central fire; in Tegea we find the Hestia of the Arcadians; and it is probable that the Achæans had theirs at Ægium. In the later mystic philosophy Hestia became the hearth of the universe, the eternal fire at the center of the world. As Hestia had her home in the prytaneum, special temples to her rarely occur. There was one in Hermione, where the only symbol of the goddess was a fire always burning on the hearth. We also hear of her house at Olympia. Her statue stood in the prytaneum at Athens beside that of peace. Though many statues of the Roman Vesta are preserved, more or less based on the Grecian conception of Hestia, yet no really Greek representation of the goddess has come down to us.

HESYCHIUS, SAINT, d. Alexandria, Egypt, 311 A.D.; a bishop of the Christian church, and publisher, according to Jerome, of an edition of the New Testament, and also a revision of the Septuagint. He was martyred during the Diocletian persecution.

HETEROPODA. See NEUCLEOBRANCHIATA, *ante*.

HETEROPTERA. See HEMIPTERA, *ante*.

HETEROSOMATA, the group of flat fishes, as the halibut, flounder, plaice, etc., which have been classified by some naturalists as a sub-order of teleost fishes, but which are now generally placed as a family called *pleuronectidae*, of the sub-order ANACANTHINI, of the order TELEOSTEI. See FLAT-FISH and PLEURONECTIDÆ.

HEUGLIN, THEODORE VON, Baron, 1824-76; African and Arctic traveler, b. Würtemberg. He went to Egypt in 1851, and till 1865 the n.e. regions of Africa were the main scene of his labors. In 1852 he accompanied Dr. Reitz, the Austrian consul at Kartum, upon his fatal journey to Abyssinia; in 1853, having been appointed Dr. Reitz's successor in the consulate, he visited Kordofan and the lower course of the white Nile; and in 1857, on his return, after about two years' absence in Europe, he was commissioned by the grand-duke Ferdinand Maximilian of Austria to explore the countries along the w. coast of the Red sea. From the latter part of 1858 to the latter part of 1860 he was again in Europe; but in 1861 he was placed at the head of the Vogel search expedition, which included Munzinger, Stendner, and Kinzelbaek, and was expected to make its way to Wadai. Having reached Mai-shecha, however, the explorers broke up into three parties, Heuglin accompanying Stendner and Schubert in the direction of Adoa, Gondar, and the Galla lands. At Khartum they joined Miss Tinné's party, and proceeded to lake Rey and the Kosanga river, but Stendner died on April 10, 1863, and Heuglin was compelled by sickness to retrace his steps. He returned to Europe in 1865. In 1870 and 1871 he made a valuable series of explorations in Spitzbergen and Nova Zembla; but 1875 found him again in n.e. Africa, in the country of the Beni-

Amer and Habab. An invitation from the khedive took him abroad again in 1876, but receiving no definite appointment he returned to Europe. Later in the same year he was engaged in preparing for an exploration of the island of Socotra, when he was suddenly carried off by inflammation of the lungs.

HEUSSER, META, 1797-1876; b. Switzerland; the daughter of pastor Diethelm Schweizer. In 1857 a volume of her poems appeared anonymously, edited by Albert Knapp, and in 1867 she published another volume at Leipsic under her own name. A selection of her most popular poems has been translated by Miss Jane Borthwick, and was published in 1875 under the name of *Alpine Lyrics*.

HEVES, a co. in n.w. Hungary, 1462 sq.m.; pop. 216,633. It is mountainous, except in the s.e., which is a part of the great plain of Hungary. Products: wine, corn, and tobacco. Chief town Gyöngyös.

HEWES, JOSEPH, 1730-79; b. N. J.; one of the signers of the American declaration of independence; educated at Princeton; became a merchant in Philadelphia, and, removing to North Carolina, was chosen delegate to the continental congress, of which he was a member, with a brief interval, for five years.

HEWIT, AUGUSTINE FRANCIS, b. Conn., 1820; graduated at Amherst, and became a minister in the Protestant Episcopal church. In 1846 he embraced the Roman Catholic faith, and two years later joined the Paulists, and became professor in their seminary in New York. He has published *Problems of the Age* and *Light and Darkness*, and has written much for magazines.

HEWIT, NATHANIEL, D.D., 1788-1867; b. Conn.; graduated at Yale college in 1808. After teaching for some years, he was licensed to preach in 1811. He studied theology at Andover, and was pastor of a Presbyterian church at Plattsburg, N.Y., 1815-17, and of a Congregational church in Fairfield, Conn., 1818-27, and in Bridgeport, Conn., 1830-62. He was one of the founders of the East Windsor theological seminary, afterwards removed to Hartford.

HEWITT, ABRAM STEVENS, b. N. Y., 1822; graduated at Columbia college, and studied law, but turned his attention to iron manufacture, and became the head of an extensive business in New Jersey. In 1867 he was one of the commissioners to the Paris exposition. He was elected to congress in 1874, 1876 and 1880. He is the son-in-law of Peter Cooper, and has been secretary of the Cooper institute from its organization.

HEYDEN, JAN VAN DER, 1637-1712; a native of Holland, an architectural landscape painter, contemporary with Hobbema and Jacob Ruysdael. He cared little for country scenes, but excelled in reproducing the bricks of old Dutch houses, and was thoroughly master of lineal perspective.

HEYWARD, THOMAS, 1746-1809; b. S. C.; went to London for his education, and on return practiced law. He was in the congress of 1776, and was one of the signers of the declaration of independence. He was a judge after the peace until 1798.

HEYWOOD, JOHN, 1500-65; known as "the epigrammatist," educated at Oxford, and afterwards made the acquaintance of sir Thomas More, who introduced him at court. His skill in music and his ready wit made him a special favorite with Henry VIII., and afterwards with his daughter queen Mary. On the accession of Elizabeth, Heywood, who was a zealous Catholic, retired to Malines in Belgium, where he died in 1565. A collection of his works was published in 1562.

HEYWOOD, THOMAS, an English dramatist of the 16th and 17th centuries. In the preface to the *English Traveler*, written in 1633, he describes himself as having had "an entire hand or at least a main-finger in two hundred and twenty plays." Of this number, which probably afterwards was much exceeded, for his last published piece did not appear until 1655, only three-and-twenty survive; but they amply attest that had he chosen to concentrate his powers he might easily have ranked with the Massingers, Fords, and others of his great contemporaries. His best pieces, such as *A Woman Killed with Kindness*, *Fortune by Land and Sea*, *the English Traveler*, and *The Fair Maid of the West*, belong chiefly to the domestic drama.

HIACOOMES, 1610-90; said to have been the first Indian convert to Christianity in New England. He was taught to read, and was for a time a preacher on the island of Martha's Vineyard, where he formed a church and became its first pastor.

HIBBARD, FREEBORN GARRETSON, D.D.; b. N. Y., 1811; at 18 years of age became a Methodist preacher. He labored in w. New York for 30 years. In 1860 he was chosen editor of the *Northern Christian Advocate*, but in 1864 he resumed preaching. Among his works are *Baptism*; *Geography*, and *History of Palestine*; *Religion of Childhood*, etc.

HICKMAN, a co. in w. Kentucky, on the Mississippi, intersected by Obion river and the Mobile and Ohio and the New Orleans, St. Louis and Chicago railroads; 229 sq.m.; pop. 70,843—1471 colored. The surface is undulating, and the soil is fertile; chief productions: corn, tobacco, and pork. Co. seat, Clinton.

HICKMAN, a co. in middle Tennessee, intersected by Duck river; 550 sq.m.; pop. '70, 9,856—1471 colored. The surface is hilly, and much of it is covered with forests. The soil is fertile; corn, cotton, and pork are the main products. Co. seat, Centerville.

HICKOK, LAURENS PERSEUS, D.D., LL.D., b. in Danbury, Conn., 1798; pastor at Newtown, Kent, and Litchfield, Conn., 1822-36; professor of theology in Western Reserve college, Ohio, 1836-44; professor in Auburn theological seminary, 1844-52; professor of mental and moral science in Union college, and vice-president, 1852-66, and president, 1866-68. Since his resignation of the last-named office he has resided at Amherst, Mass. His published works are: *Science of the Mind*; *Rational Psychology*; *Moral Science*; *Rational Cosmology*; *Creator and Creation*; *Humanity Immortal*; *Logic and Reason*. His philosophical views may be indicated by a brief outline of his *Science of the Mind* and of a part of his *Moral Science*.—SCIENCE OF THE MIND. I. *General facts of the mind*: 1. The fact of its existence. 2. Its existence not phenomenal, or ideal. 3. It has its conscious identity through all changes. 4. It is essentially self-active. II. *Primitive facts of mind*.—1. Sensation. 2. Consciousness. 3. Capacity for knowing, or intellect; for feeling, or susceptibility; for willing, or the will. Intellect comprises sense, understanding, and reason; susceptibility is animal, rational, and spiritual; the will has immanent preferences, governing purposes, and desultory volitions. 4. Man, endowed with these mental capacities, is competent to attain the end of his being.—MORAL SCIENCE. *Pure morality*. I. Duties to mankind: 1. Personal duties. *Self-control*. General maxim: Bear and forbear. Particular maxims: Do yourself no harm; keep under your body; rule your spirit. *Self-culture*. General maxim: Purify and perfect your whole being. Particular maxims: Grow in stature; in practical knowledge; in rational wisdom. 2. Relative duties. *Kindness*. General maxim: Do good unto all men as you have opportunity. Particular maxims: Owe no man anything; give to the poor; be thankful. *Respect*. General maxim: Honor all men. Particular maxims: Be courteous; deal justly; sustain your neighbor's good name; be obedient to government. II. Duties to nature: Do not mar it; use it; adorn and perfect it; explore it; make it a discipline to virtue. III. Duties to God: General maxim: Worship God. Particular virtues: Humility, reverence, godly fear.

HICKORY, a co. in s.w. Missouri, intersected by Pomme de Terre river; 408 sq.m.; pop. '80, 7,388—50 colored. About half the surface is prairie; the remainder is undulating and mostly covered covered with forests. Productions: corn, wheat, oats, and pork. Co. seat, Hermitage.

HICKS, ELIAS (*ante*), very early in his career became known as a strong opponent of slavery, against which he directed some of his most powerful discourses; making in addition personal exertions and sacrifices to protect and encourage emancipated slaves. He was bold and outspoken, and his meetings drew together people of all creeds. The name of Hicksites, given by way of reproach to the branch of the society of Friends to which he adhered, was never recognized by him. His relations to the society are best given in his own words. He felt himself called upon, under the influence of the love of the gospel, to admonish his brethren to rally to the ancient standard, the light of truth manifested in the heart, and to follow no man any farther than he should be found a follower of Christ. A journal of his religious travels has been published; also, *Observations on Slavery* and *Doctrinal Epistle*. A volume of his sermons has been published since his death.

HICKS, THOMAS, b. Penn., 1823; began to paint portraits when a boy 15 years of age; studied art in New York, and was represented in the exhibition of 1841 by "The Death of Abel." He resided in Europe, 1845-48, chiefly at Rome; then studied in Paris, and returned in 1849 to settle in New York. He is best known as a successful portrait-painter. Among other portraits from his brush are those of Dr. Kane, Longfellow, Margaret Fuller Ossoli, Henry Ward Beecher, Edwin Booth as "Iago," and a large painting of "Contemporaneous Authors of America."

HIDAGE, an extraordinary tax payable to the kings of England for every "hide" of land. This tax was levied in money, provision, armor, and other articles; and when the Danes landed in Sandwich in 991, King Ethelred taxed all his lands by hides, so that every 310 hides found one ship furnished, and every eight hides furnished one jack and one saddle, to arm for the defense of the kingdom. Sometimes the word hidage was used to signify exemption from that tax; and this immunity was also called *hide-gild*, and signified a price or ransom paid to save one's skin.

HIDALGO, a co. in s.w. Texas, on the Rio Grande; 3,250 sq.m.; pop. '80, 4,347—114 colored. A large part of the soil is sandy, but produces good pasturage; a portion is productive, and with irrigation will yield two crops in a season. Stock-raising is the chief business. Co. seat, Hidalgo.

HIDALGO Y COSTILLA, DON MIGUEL, a South American, b. near the close of the 18th c.; executed in Mexico July 27, 1811. He was a Roman Catholic priest, but so much dissatisfied with the government of Mexico, in which country he had settled, that he conspired with the Indians to produce a general insurrection on Nov. 1, 1810. Fear of discovery led him to hasten his plans, and the revolt began in September among

the officers of the garrison at Guanajuato. His eloquence had a powerful effect on the people, and to heighten the enthusiasm he held aloft a figure of Our Lady of Guadalupe, patron saint of Mexico, and gave to his insurrection the character of a crusade. He plundered several cities, and finally proceeded to attack the capital; but an excommunication being issued against him by the archbishop, his followers were inspired with mistrust, and two almost simultaneous defeats culminated in a total rout of all his forces, Jan. 17, 1811. He set out for the United States, to procure assistance, but was captured, degraded from his priestly office, and shot. Some years later he was extolled as a saint.

IIDES. See **LEATHER**, *ante*.

HIERAPOLIS, a city in Phrygia, at the junction of the Lycus and Meander. It possessed warm springs which had and still have a remarkable power of forming incrustations. Its name Hierapolis is due to the sanctity conferred on it by these hot springs and by the Plutonium, a small cave under a projecting rock, from which there constantly emanated a dark vapor deadly to man and beast. In reference to this we sometimes find on its coins Pluto carrying off Proserpine. The water was also much used for dyeing. Nothing is known of the origin of the city; from the legend on coins, with a radiant head of the sun-god, Eckhel concludes that a Greek foundation was made under the guidance of Apollo; but a native city may have already existed there. On the coins of the city occur native names of the sun-god, probably a Phrygian form of the Greek Zeus, the goddess of healthful drinking, Euprosia, and Cybele who was one of the chief deities of the place. Little is known of the history of the city. The philosopher Epictetus was born there; and there St. Paul founded a church. The very considerable ruins which still exist, called Pambuk Kalesi ("Cotton Castle"), have been described by Pococke, Leake, etc. The ancient theater and gymnasium are in a state of remarkable preservation.

HIERAPOLIS, a city in Syria, 16 m. s.w. from the junction of the Euphrates and the Sajur. Besides the natural strength of its position, it was important as lying on the line of intercourse between n. Syria and Mesopotamia, and was always a great trading city. Its early history is quite unknown. It is not mentioned during the Assyrian wars in this part of Syria. Abdul Faráz asserts that Josiah was defeated there by Pharaoh Necho (611 B.C.) on his march towards Carchemish; but according to 2 Chron. xxxv., the battle took place at Megiddo, some distance w. of the Jordan, and probably Abdul Faráz confounded places altogether different. No proof exists that Hierapolis was an important city before the time of the Seleucids, and prof. Sayce suggests that it then succeeded to the trade and name of the older city, Bambyce, which had now decayed. The romance of trade by which this name has become naturalized in many European languages deserves a passing notice. As the city lay on the highway to the east, cotton and silk were important branches of its trade. Probably cotton plantations existed there in old time; and after the cultivation of silk was introduced to w. Asia, in the time of the Sassanian kings, large groves of mulberry-trees surrounded the city. In Asia cotton seems to have been recognized as a distinct article of commerce, and was named after the city which was the chief seat of its manufacture, as muslin is from Mosul. By the crusaders the stuff and the name were carried to Europe, and the latter exists in English in the form of "bombazine." The Syrian goddess Atargatis, called by the Greeks Decerto, a personification of the nature power worshipped under different names over the whole of w. Asia, had one of her most famous temples in the city; and perhaps Mambe may have been a local name for the goddess. Hence in the 3d c. B.C., when, under the Seleucid kings, Bambyce became a great Greek city and the most important station between Antioch and Seleucia, it was called Hierapolis or Hieropolis. The latter form is found on coins, the former is used in classical literature. The coinage of Hierapolis begins under the Seleucids. The autonomous coins, probably for commercial reasons, imitate closely the coins of Antioch. The temple was plundered by Crassus on his Parthian expedition (53 B.C.). Under Diocletian or Constantine, Hierapolis became the capital of the new province of Euphratensis, a name which soon gave place to the older name Commagene. As paganism decayed, Hierapolis ceased to be the sacred city, and recovered its ancient name; at the same time its importance and population declined. In the time of Julian, who concentrated there the Roman troops for the fatal Parthian campaign, it was still one of the greatest cities of Syria; but under Justinian, who made some attempt to restore it, great part of its area was a desert; and the once strong fortifications were so decayed that the place was not defensible against the Parthian king Chosroes. At the Arab conquest it passed into the hands of the caliphs. Haroun-al-Raschid (786-808) restored it and strengthened its walls, and it is mentioned about 1150 by Edrisi as a strong city. As the empire of the caliphs dwindled, it appeared as Mambedj, a frontier post in the struggle between Christians and Mohammedans, and its possession carried with it the rule in this part of Syria. The emperor Romanus Diogenes captured it in his gallant struggle against the Turks (1068). Recaptured by the Seljuk Turks, it soon afterwards fell into the power of the crusaders, until it was stormed by Saladin (1175). It was for some time the head-quarters of the Mongol host under Hulagu Khan; and, as with many other Syrian cities, its desolation dates from this time. The ruins which still exist, called Kara Bambuche or Buyuk Mambedj, have been described by Pococke and others, and most carefully by Chesney.

HIERAX, an ascetic of the 3d c. A.D. in Egypt, where he lived to the age of 90, supporting himself by caligraphy and devoting his leisure to scientific and literary pursuits, especially to the study of the Bible. He was the author of biblical commentaries both in Greek and Coptic, and is said to have composed many hymns. He ultimately became leader of the sect of the Hieracites, an ascetic society from which persons living in the married state were excluded, and of which one of the leading tenets was that only the celibate could enter the kingdom of heaven. This doctrine they based on a literal interpretation of the parable of the ten virgins; on other points, however, Hierax followed Origen in allegorizing Scripture; thus he thought that the narrative of the fall and the doctrine of the resurrection ought both to be taken in a scriptural sense. It is upon this apparently Manichaean view of matrimony, taken with his denial of the resurrection and of a visible paradise, and his assertions that infants, as incapable of "striving lawfully," cannot inherit the kingdom of God, that his reputation as a heretic chiefly depends.

HIERO I. (*ante*), Tyrant of Syracuse, succeeded his brother Gelon, 478 B.C. Hiero had already distinguished himself at Himera. A jealousy arising between him and his brother Polyzelus, who had the command of the army, war was on the point of breaking out between Hiero and Theron of Agrigentum, who had espoused the cause of Polyzelus, when a reconciliation took place between the brothers. Hiero seized Naxos and Catania, transferring the inhabitants to Leontini. Peopling Catania with natives of Syracuse, he changed its name to Ætna. Upon the death of Theron war broke out between Hiero and Thrasydaus, son of Theron, but victory declared in favor of Hiero. His tyrannical measures led him to fear attempts against his life, and he kept up a large body of mercenaries, as well as numerous spies. He deserves credit in two important respects. By his vigorous assistance to the Cumæans the power of the Etruscan pirates was completely destroyed. Besides defeating the pirates, Hiero was the patron of poets and philosophers. He has been immortalized in the *Odes* of Pindar as a successful competitor at the Grecian games.

HIERO II. (*ante*), King of Syracuse, b. near the end of the 4th c. B.C. For upwards of 40 years Hiero was the steady friend of the Romans. He gave them valuable aid during the first Punic war at the sieges of Agrigentum and Lilybæum. As a reward, the tribute which he formerly paid was remitted, and he was included in the treaty of peace at the close of the first Punic war, 241 B.C. After this he visited Rome, where he displayed great liberality and received signal honors. At the breaking out of the second Punic war he remained equally steady in his friendship with the Romans, whom he assisted with ships and provisions. He is supposed to have died 216 B.C., upwards of 90 years of age. His government was mild and eminently popular. He laid aside the pomp of royalty, and was scarcely distinguishable from a private citizen. The corn laws which he established were so admirable that in subsequent times, when the Romans took possession of Sicily, they were retained.

HIEROCLES OF BITHYNIA, 284-305 A.D., a Roman proconsul in the reign of Diocletian; is said to have been the instigator of the fierce persecution of the Christians under Galerius Cæsar in 303. He was a man of considerable intellectual culture, and wrote a work in two books, in which he endeavored to persuade Christians that their sacred books were full of contradictions, and that in moral influence and miraculous power Christ was inferior to Apollonius of Tyana. This treatise has not come down to our times, and is known to us through Lactantius, and still more through Eusebius, who is the author of a refutation.

HIERONYMUS, King of Syracuse, grandson of Hiero II., succeeded to his grandfather at the age of 15, 216 B.C. Up to this time a close friendship had subsisted between the Romans and Syracusans. But the battle of Cannæ, in which the Romans were so terribly defeated, disposed many of the Syracusans to join the Carthaginians. Hiero II. had appointed 15 guardians, including Andranodorus and Zoippus, to guide the young prince, but through the intrigues of Andranodorus, who was favorable to the Carthaginians, the guardians were all induced to resign their office. The young prince was now entirely under the influence of Andranodorus and Zoippus, who were sons-in-law to Hiero II. Communications were at once opened up with Hannibal. The Carthaginian envoys were received with great favor, whereas the Roman envoys were treated with contumely. Hieronymus was preparing to take the field against the Romans with 15,000 men, when he was assassinated in Leontini by conspirators under Deinomenes. His short reign of one year and one month was disgraced by indulgence in luxury, debauchery, and cruelty.

HIERONYMUS. See *JEROME*, *ante*.

HIESTER, JOSEPH, 1752-1833; b. Penn.; a merchant. In the war of the revolution he raised, armed, and led a volunteer company. He was wounded in the battle of Long Island, captured and confined on board the prison-ship *Jersey*. He was in congress for 14 years, and in 1821-23 was governor of his state.

HIGGINSON, FRANCIS, 1588-1630; b. England; educated at Cambridge, and was a rector in Leicester, but was deprived of his benefice for non-conformity. Arriving at Salem, Mass., in 1629, he became teacher of the congregation at that place. He wrote

New England's Plantation, or a Short and True Description of the Commodities and Dis-commodities of the Country, and also an account of his voyage.

HIGGINSON, JOHN, 1616-1708; son of Francis, b. England. He accompanied his father to Massachusetts, and settled as a preacher in Guilford, Conn. In 1660 he was pastor of the First church in Salem, and passed the remainder of his life there. He was 72 years in the ministry.

HIGGINSON, THOMAS WENTWORTH, b. Mass., 1823; a descendant of Francis Higginson, graduated at Harvard college in 1841, and at the divinity school in Cambridge in 1847; after which he became the minister of the "First religious society" in Newburyport. His antislavery principles offended a part of his congregation, causing him to resign in 1850. Two years later he became minister of a "free church" in Worcester. He was the leader of the men who in 1853 attempted to effect the rescue of Anthony Burns, a fugitive slave confined in the court-house in Boston, in custody of the U. S. marshal. The attempt was unsuccessful, and he was wounded in the face by a saber cut. One of the marshal's men having been killed in the fray, Mr. Higginson was indicted for murder, but not convicted. In 1856 he went to Kansas and took an active part in the measures by which that state was prevented from becoming an abode of slavery. He now relinquished the ministry to devote himself to literature, but on the breaking out of the war of the rebellion he exerted himself to procure enlistments, and entered the service with the rank of capt. In 1862 he was appointed col. of the first regiment of South Carolina volunteers, the first regiment of emancipated slaves that entered the service. He led this regiment for two years, making various expeditions within the confederate lines, and capturing Jacksonville, Fla. In Aug., 1863, he was wounded, and in 1864 was compelled on that account to retire from the service. He then took up his residence at Newport, R. I., and resumed the literary labors which had been interrupted by the war. Since that time he has published *Outdoor Papers*; *Harvard Memorial Biographies*; *Malbone, an Oldport Romance*; *Army Life in a Black Regiment*; *Atlantic Essays*; *Oldport Days*; and a new translation of Epictetus. In 1878 he removed to Cambridge, Mass., where he still resides. He represented that city in the general court in 1880. He has been for many years a very earnest advocate of woman suffrage.

HIGHLAND, a co. in s.w. Ohio, on the Marietta and Cincinnati railroad; 475 sq. m.; pop. 70, 29,133. The surface is generally level, and to a large extent covered with timber. The soil is fertile; main products: corn, wheat, oats, and pork. Co. seat, Hillsborough.

HIGHLAND, a co. in w. Virginia, bordering on West Virginia, watered by affluents of the Potomac; 450 sq. m.; pop. 70, 4,151—348 colored. Surface rough, being invaded by a range of the Alleghany mountains. The valleys are fertile, producing corn, wheat, etc. Co. seat, Monterey.

HIGHLANDS OF THE HUDSON, a range of hills and mountains, seemingly a continuation of the Blue Ridge of Virginia, connecting with and including the Palisades, appearing e. of the Hudson river in the vicinity of West Point, and extending with gradually lessening elevations to the Green mountains of Vermont. In their course there may be found much splendid scenery.

HIGHWAY (*ante*), in a general way the regulation for the construction and management of roads for travel is nearly the same in the United States as in England. Formerly the right to make streets with or without the approval of neighboring property-owners was vested mainly in municipal corporations; but in the case of railways, in modern times, it has become common to require the consent of a majority of the owners along the proposed route. Occasionally, where a road goes through purchased or seized property, it amounts to private property, and none but the owners may intrude thereon. Turnpikes or toll roads were once very numerous, but at present are less so. Cities and towns are responsible for the condition of their highways, and are expected to keep them in good condition. There is a strange difference in the "right of the road" here and in England. In the latter country the law and custom require meeting teams or persons to turn to the left, in the United States it is to the right. Usually the facing owners or cross owners of lots on a highway have the right of property to the middle or across such highway, and may use their property in any way that does not interfere with travel on the road.

HILARIA, a great Roman festival celebrated in honor of Cybele at the vernal equinox. It was begun on Mar. 22, and brought to a close on the 25th. The last day of the feast was the most important, and upon it the inhabitants of the city abandoned themselves to the most extravagant merry-making. All kinds of amusements were then in vogue, especially masquerading, which from the earliest times has been popular in Italy. The only religious ceremony in connection with it was the solemn procession of the priests, who bore round the streets the statue of the great mother of the gods with many solemnities. The festival had for its object the celebration of the departure of winter with its snows and gloom, and hailed the approach of spring.

HILARION, SAINT, 288-371; b. at Gaza of heathen parents. Attracted by the fame of St. Anthony, he went to visit that saint in his solitude, and forthwith became his
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disciple. Returning to Palestine with some companions while still only a lad of 15, he gave away all the property which he had inherited by the recent death of his parents, and withdrew into the loneliness of the desert between the sea and the marshes on the Egyptian border. In this solitude he observed the most rigid asceticism, and (to quote the quaint remark of Butler) "thought himself at liberty to practice certain mortifications which the respect we owe to our neighbor makes unseasonable in the world." Twenty years of patient continuance in the way of life he had chosen for himself were rewarded, we are told, with miraculous gifts and with rapidly growing fame; disciples and imitators multiplied to the number of two or three thousand, and were all under the spiritual control of Hilarion. When 65 years old, the death of St. Anthony being revealed to him, he undertook an extended tour into Egypt, and visited the scenes of that saint's labors; afterward he proceeded in company of a favorite disciple, Hesychius, to Sicily, where, however, his popularity rendered the quiet and retirement which were congenial to him, impossible. A further migration to Epidaurus thus became necessary, and ultimately he found a resting-place in Cyprus, the diocese of his old friend Epiphanius, where in a lonely cell among some almost inaccessible rocks he died. According to Sozomen, his festival was observed in Palestine with great solemnity as early as the 5th c.; he is now commemorated by the Roman church on Oct. 21.

HILARY, POPE; d. Rome 467 A.D. He succeeded Leo the great in the papal office in 461. He was an earnest promoter of the faith, and was severe in discipline. During his pontificate canons were adopted forbidding the ordination of men who had married a second time; or those who had married widows; and also forbidding bishops to nominate their successors.

HILARY THE DEACON, b. in Sardinia in the middle of the 4th c. He and Lucifer of Cagliari appeared at the council of Milan before Constantius, to defend the followers of Athanasius. His remarks offended the emperor so much that he was ordered to be scourged and sentenced to banishment. He held that all heretics, including Arians, should be rebaptized before admission into the Catholic church. Some of the writings ascribed to him are probably not his.

HILDA, SAINT, 614-80; a Saxon lady whose name is intimately associated with the history of the early English church and of early English literature. She was a member of the royal family of Northumbria, her father Hereric being a nephew of king Edwin; and it was along with her royal kinsman that, as a girl of 14, she received baptism at the hands of Paulinus. During the pagan reaction which followed Edwin's defeat and death, Hilda was tempted to settle with her widowed sister Hereswith at the monastery of Chelles, 12 m. from Paris; but she was recalled to England by bishop Aidan, the missionary from Iona, and in 619, two years after her consecration as a nun, she was appointed to succeed Heru the abbess of Heortea or Hartlepool. When, in fulfillment of the vow which he had made before the decisive battle with Penda, Oswy came to dedicate his daughter to God, it was to the care of Hilda that he intrusted her. In 658 the abbess founded the famous monastery on the cliffs of Streoneshalh or Whitby, and for the next 22 years she ruled with rare ability and virtue over the double community of monks and nuns which gathered around her. Among those who shed the most abiding luster on the establishment were St. John of Beverley and the Saxon poet Cædmon. Hilda died, full of years, mourned by her nuns as their common mother. There is a St. Hilda's church both at South Shields and at Hartlepool, and the latter preserves her effigy on its ancient seal. At Whitby the tradition long lingered that on a summer forenoon, when the sun shone in the highest windows of the n. part of the abbey, the figure of lady Hilda could be discerned; and the fossil ammonites of the neighborhood are popularly known as St. Hilda's snakes.

HILDBURGHHAUSEN, chief t. of a circle in the duchy of Saxe-Meiningen, Germany, in a wide and fruitful valley on the river Werra and on the Werra railroad, 17 m. s.e. of Meiningen; pop. '75, 5,162. It is the seat of a district court, of a court of appeal, and of the jury court for the duchy. The streets are wide and regular, and the principal buildings are the former castle of the duchy, erected 1685-95, now used as barracks, with a park in which there is a monument to queen Louise of Prussia; the old town-house, the government buildings, the gymnasium erected in 1877, the normal seminary, and the lunatic asylum. A monument has been erected to those of the citizens who died in the Franco-Prussian war of 1870-71. The manufactures are very various, and include linen fabrics, cloth, papier-maché, toys, buttons, optical instruments, agricultural machines, knives, mineral waters, condensed soups, and condensed milk.

HILDEBRANDT, EDUARD, 1817-68, b. Germany, an artist who commenced life as apprentice to his father, a house-painter at Dantzic. At the age of 20 he went to Berlin, and attracted the attention of Krause, a painter of sea-pieces. His early works betray timidity, and are characterized by great formality; and, had he remained under the influence of German artists, it is questionable whether his genius would ever have triumphed as it did; but, after seeing the French pictures exhibited in Berlin, he was seized with such an enthusiasm for the style he recognized in them, that he set out at once for Paris, and devoted himself to mastering the mysterious secrets of effect, in which the artists of that nation excel. The pictures painted by him upon his return to

Germany are impressed with the stamp of the French school, but at the same time reveal the keen active spirit which was quick to render momentary changes of atmosphere and tone. Humboldt's influence led him to travel, and in 1864-65 he accomplished a tour round the world. In his anxiety to produce rapidly, his facility of hand diminished the value of his works for those who regard composition and harmony of tone as the essentials of a picture. His course may be compared to that of a comet, breathlessly rapid and brilliant. He excelled in producing picturesque and startling effects, both by contrast and by his faculty of seizing and reproducing natural phenomena. Fantasies in brilliant colors, views of vast extent, as from the Himalayas and Andes, narrow crowded streets in Suz or Cairo, panoramas, and tortuous lanes and alleys, all served as material for his genius. He died young, and his pictures are scattered throughout Germany; a few of the best being in various collections in Berlin.

HILDRETH, RICHARD, 1807-65, an author and journalist, b. Mass. He graduated at Harvard college in 1826, studied law in Newburyport, and entered into practice in Boston. In 1832, however, he abandoned the profession to become the editor of the *Boston Atlas*. In the autumn of 1834, being out of health, he went to the south, where he resided nearly two years on a slave plantation. The slavery question was then causing much excitement in the country, and he improved the opportunity to study the workings of the institution for himself. During this time he wrote an antislavery novel, which was published in 1837 under the title of *Archy Moore*. This work was reprinted in England, and in 1852 it was republished in this country under the title of *The White Slave*. It is a tale of thrilling power, and, if the public mind had been prepared for its reception as it was for *Uncle Tom's Cabin*, it could hardly have failed to make an impression as powerful as that produced by Mrs. Stowe's later work. In 1840 appeared his translation of Dumont Bentham's *Theory of Legislation*. His *History of Banks* was published shortly afterwards. When the project for the annexation of Texas began to attract the attention of the country, he published in the *Boston Atlas* a series of articles which did much to intensify the hostility of the northern people to that scheme. He passed the winter of 1837-38 in Washington as correspondent of the *Atlas*, and, upon his return to his editorial chair, entered warmly into the campaign for the election of gen. Harrison to the presidency. In 1840 appeared his *Despotism in America*, a work on the political, economical, and social aspects of slavery. A second edition, with a chapter on *The Legal Basis of Slavery*, appeared in 1854. He published several controversial pamphlets, among them a letter to prof. Andrews Norton, of Cambridge, on *Miracles*, in which the views of that gentleman were warmly opposed. From 1840 to 1843 he resided in Demerara, British Guiana, busying himself in editing two newspapers, in which he advocated the system of free in opposition to slave labor. He also wrote, while there, his *Theory of Morals* and his *Theory of Politics*, which were published after his return. The work, however, for which he is most likely to be remembered is his *History of the United States*, in six volumes, in which he professes to present the founders of the republic in their true character, without any attempt to heighten their virtues or disguise their mistakes and faults. The history is brought down to the close of Mr. Monroe's first presidential term. In 1855 appeared his *Japan as it Was and Is*. For several years, ending with the inauguration of Lincoln as president, he was engaged on the staff of the *New York Tribune*. He went abroad in the summer of 1861 as U. S. consul at Trieste, and died in Florence.

HILGARD, JULIUS ERASMUS, b. Germany, 1825; came to Illinois in 1835; received a classical education; studied engineering, and in 1845 was employed in the coast survey service, in which he continues. In 1862 he had chief charge of the office, and supervision under the treasury department of weights and measures. He was one of the members of the metric commission at Paris in 1872, and was made one of the permanent committee. In 1874 he was president of the American association for the advancement of science.

HILL, a co. in central Texas, on Brazos river; 1000 sq.m.; pop. '70, 7,453-806 colored. It has an undulating surface, and is largely occupied with forests. The soil is fertile; chief productions: cotton, corn, and pork. Co. seat, Hillsborough.

HILL, AMBROSE POWELL, 1825-65; graduate of the West Point academy; served in the Mexican and Florida wars; afterwards in the coast survey, and in 1861 resigned and took military service in aid of the rebellion. He rose to be lieut.gen., but was killed before Petersburg by a rifle-shot.

HILL, BENJAMIN HARVEY, b. Ga., 1823; graduated at the state university, and began the practice of law in 1845. Six years later he was elected a member of the legislature. He was an early secessionist, a member of the provisional confederate congress, and in the regular confederate senate. In 1865 he was for a time a prisoner of war. In 1872 he supported Greeley for the presidency; was elected to the 44th and 45th congresses, and resigned to take his seat in the U. S. senate, 1877.

HILL, ISAAC, 1788-1851; b. Mass.; became a printer, and editor and proprietor of the *New Hampshire Patriot*, a noted democratic newspaper. He was chosen U. S. senator from New Hampshire in 1830; was governor, 1836-39, and was afterwards an

officer of the treasury department in Boston. He was for many years the publisher of *The Farmer's Monthly Visitor*.

HILL, JOHN HENRY, D.D., LL.D.; b. N. Y. 1791; graduated at Columbia college, and entered the Protestant Episcopal ministry. He went as a missionary to Greece about 1835, and has been on duty there for half a century.

HILL, ROWLAND, 1744-1833; an English preacher of great eccentricity. While still at Cambridge he made the acquaintance of the Methodist preacher Whitefield, and stimulated by his example he scandalized the university authorities and his own friends by preaching in the surrounding villages before taking holy orders, and conducting religious services in the houses of the sick and poor. He graduated with honor, and taking orders, was appointed, 1773, to the parish of Kingston, Somersetshire, where he indulged his taste for open-air preaching, and attracted great crowds to the services which he held nearly every day of the week. Having on the death of his father in 1780 inherited considerable property, he built for his own use Surrey chapel, in the Blackfriars road, London. The chapel was opened June 8, 1783. Although he now occupied a position as a dissenting minister, Hill conducted his services in accordance with the forms of the church of England, in whose communion he always remained. From the first his success was perfect, and his chapel soon became filled with a larger congregation than any other in London. In the summer months he made what he called "gospel-tours" into all parts of the country, sometimes extending them to Scotland and Ireland, and attracting wherever he went crowded and interested audiences. After these tours he invariably returned with increased enthusiasm to his duties at the Surrey chapel, where he continued to officiate to the end of his life. His oratorical powers, like those of Whitefield, were specially adapted for rude and uncultivated audiences, and were equally effective. He possessed a voice of great power, and, according to Southey, "his manner" was "that of a performer as great in his own line as Kean or Kemble." He occasionally violated laws of good taste by the eccentricities of his wit and humor, but the intensity and purity of the purpose by which he was actuated maintained his moral influence. Among other publications he wrote *Village Dialogues*, which first appeared in 1810, and reached a 34th edition in 1839.

HILL, THOMAS, D.D., LL.D., b. N. J., 1818; educated at Harvard; studied theology; settled at Waltham, Mass., in 1845; in 1859 became president of Antioch college, and in 1863 of Harvard college; resigned in 1868. He accompanied Agassiz on his expedition to South America, and upon his return took a pastoral charge in Portland, Me. He has published poems, an elementary treatise on arithmetic, a work on geometry; *Liberal Education*; *Jesus the Interpreter of Nature*; *Natural Sources of Theology*, etc.

HILLARD, GEORGE STILLMAN, LL.D., b. Me., 1808; graduated at Harvard, 1828; was assistant of George Bancroft in a seminary at Northampton, Mass.; in 1833 became a member of the bar in Boston, and soon acquired a large practice. He was chief officer of the Boston common council; a member of the state legislature and of the senate, and in 1867 U. S. district attorney. In connection with George Ripley, he was, in 1833, editor of the *Christian Register*, a Unitarian paper. Subsequently he turned his attention to literary work and to lecturing. In 1853 he traveled in Europe, and on his return published *Six Months in Italy*, which has passed through many editions, and is still a standard work of its class. He was afterwards a regular contributor to the *Boston Courier*, and wrote a number of biographical works. He died in 1879.

HILLHOUSE, JAMES, LL.D., 1754-1832; b. Conn.; graduated at Yale, and practiced law. He took an active part in the war of the revolution, and at the invasion of New Haven by the English, commanded the governor's guards. In 1791 he became a member of congress, a senator in 1795, and temporary president of the senate in 1800. In 1815 he was a member of the Hartford convention.

HILLHOUSE, JAMES ABRAHAM, 1789-1841; b. Conn.; in early life was a merchant, and in 1819 visited Europe. About 1832 he retired from active business and devoted himself to literature, more especially to verse. His chief works are *Percy's Masque*; *Hadad*; and *The Judgment*. His poems have been collected and published.

HILLSBOROUGH, a co. in w. Florida, on the gulf of Mexico and Tampa bay; 2,900 sq.m.; pop. '70, 3,216—546 colored. Surface low and level; productions: cotton, sugar, corn, etc. Co. seat, Tampa.

HILLSBOROUGH, a co. in s. New Hampshire, on the Massachusetts border, on the Merrimac, the Contoocook and other rivers, and intersected by three railroads; 900 sq.m.; pop. '70, 64,238; in '80, 75,606. It has a hilly surface, and much of it is covered with forests. Chief productions: corn, butter, potatoes, and hay. Co. seats three in number: Manchester, Nashua, and Amherst.

HILLSDALE, a co. in s. Michigan, on the Ohio border; drained by the Kalamazoo river, intersected by the Michigan Southern, and the Detroit, Hillsdale, and South-western railroad; 580 sq.m.; pop. '80, 32,726. It has a diversified surface, with expansive forests. The soil is fertile, producing wheat, corn, etc. Co. seat, Hillsdale.

HILLSDALE, a city and seat of justice of Hillsdale co., Mich., on the Lake Shore and Michigan Southern railroad, near the St. Joseph's river, 90 m. w.s.w. of Detroit;

pop. 3,684. Hillsdale college (Free Baptist) is situated here, and there are churches, banks, good schools, and a number of manufactories.

HILO, in regard to size the second t. in the Sandwich islands; pop. '72, 4,220. It is on the e. coast of Hawaii, and has a good harbor, protected by a reef of lava and coral. The town and region are famous for natural beauty. There are four churches, including a Protestant and Roman Catholic church for the natives, a foreign church, and a Bethel for sailors. The trade-winds striking against Mauna Kea, a mountain back of the district of Hilo, bring very frequent rains, the rainfall measuring 182 in. in a single year. These rains supply some 50 streams, which empty into the sea within a coast line of 25 m., and are often swollen with violent freshets.

HIMERA, a city on the n. coast of Sicily, founded 648 B.C. by Chalcidians of Tancle and Syracusan exiles, who gave a Doric character to the language. Early in the 5th c., the tyrant Terillus, being expelled by Theron of Agrigentum, invoked the aid of the Carthaginians. They gladly availed themselves of the pretext, but their general, Hamilcar, was defeated at Himera by the Greeks under Gelon of Syracuse, 480 B.C. Thrasylæus, son of Theron, brought a large body of Doric emigrants to the city in 476; but was soon expelled by Hiero. Himera seems to have enjoyed great prosperity during the remainder of the 5th century. In 415 it refused admittance to the Athenian fleet, and remained a zealous ally of Syracuse. In 408 the Carthaginians sent another great army under Hannibal, grandson of Hamilcar, who razed the city to the ground. A new city, *Thermæ Himerenses*, was founded in 407 close to the former site. The name was derived from the famous hot springs in which Hercules was said to have bathed. The new city remained in Carthaginian hands until it was annexed by the Romans during the second Punic war. It was peculiarly favored by them, and was left a free city under its own laws. In the time of Cicero it was a flourishing town, though not very large. Under Augustus it became a colony. From that time little is known of it, although the site was never deserted, and the town still exists under the name of Termini. Ergoteles, an Olympian victor celebrated by Pindar, was a citizen of Himera. Stesichorus the poet was a native of the city; and his statue was preserved at *Thermæ* in the time of Cicero. Agathocles also was a native of *Thermæ*.

HIMILCO, or **HIMILCAR**, a Cathaginian navigator, who explored the n.w. coast of Europe, about 570 B.C., at the same time that Hanno explored the w. coast of Africa. Avienus has preserved some fragments of the history of this voyage, in which mention is made of the Hiberui and Albioni, and of a promontory, Oestrymnis, thought to be Cornwall, and a group, Oestrymnides, thought to be the Scilly islands.

HIMILCO, or **HIMILCAR**, a Cathaginian general, son of Hanno, who commanded the expedition against Sicily, 406 B.C., and conquered the w. part of that island. When Dionysius renewed the war, 397 B.C., Himileo again commanded the Cathaginians, at first with success, but subsequently Dionysius assaulted him when greatly disabled by pestilence, and forced upon him a disgraceful capitulation. Himileo abandoned his allies and mercenaries to the mercy of the enemy, and actually paid a large gratuity for permission to depart himself with his native Cathaginians. The disgrace of this surrender so weighed upon him, that soon after returning to Carthage he committed suicide.

HIMMALEH. See **HIMALAYA**.

HIMYARITES, people of Arabia who claim Himyar, one of the mythical fathers of the Arabians 3,000 years before the time of Mohammed, to have been their ancestor. In s. Arabia they built prosperous towns, Aden among them, and spread their rule over the opposite African coast. At one time they favored Christianity, but in 529 A.D. they were conquered by the Ethiopians and compelled to renounce their faith. About 630 A.D. they were subjected by the Mohammedans and compelled to profess that faith.

HIMYARITIC LANGUAGE AND INSCRIPTIONS, or the language of the races from the Euphrates to Abyssinia, who trace their origin to Himyar. It is doubtful whether it is a dialect of Arabic only or an independent language. Inscriptions in this language are to be found in s. Arabia, and some specimens are now in the British museum. They probably date from the later Himyarite kings, who flourished from 100 B.C. to A.D. 500. Osiander considers the Himyaritic language as an early form of Hebrew and Assyrian.

HINCKS, EDWARD, D.D.: 1792-1866; b. Ireland; graduated at Trinity college, Dublin, and became a clergyman. In 1826 he was appointed rector of the parish of Killyleagh. He was an enthusiastic archaeologist, and wrote on Egyptian and Assyrian inscriptions. He published a catalogue of the Egyptian manuscripts preserved in the library of Trinity college, and some works on religious subjects.

HINCKS, Sir FRANCIS, b. Ireland, 1807; was engaged in early life in mercantile business in Canada, and subsequently in journalism, being proprietor of the *Toronto Examiner*. He was successively finance minister of the colony, and in 1851 prime-minister. In 1855 he was made governor of the Windward islands, and governor of British Guiana in 1862. In 1869 he was knighted, and was again chosen finance minister of Canada.

HINDS, a co. in s.w. central Mississippi, on Pearl and Big Black rivers, crossed by the Vicksburg and Meriden, and the New Orleans, St. Louis and Chicago railroads; 930 sq. m.; pop. '70, 30,488. The surface is level and the soil fertile; cotton, corn, and pork are the chief products. Co. seat, Jackson (the state capital).

HINGHAM, a t. in Plymouth co., Mass., on the sea-coast, intersected by the Old Colony railroad; the village is 12 m. by water from Boston; pop. of township, 4,485. The village is a strange old place near Nantasket. It was settled in 1635, and its first pastor came from the place of the same name in England. In the cemetery there is a fine monument to the early settlers, and a statue to the memory of John A. Andrew, the "war governor" of Massachusetts. Derby academy is located here, and there are other schools, churches, and manufactures. It is a popular place of summer resort.

HINSDALE, a co. in s.w. Colorado on the Rio del Norte and Gunnison rivers, formed after the census of 1870. The surface is mountainous, and some of the peaks are remarkably high. There are silver mines in operation. Co. seat, Lake City.

HINSDALE, **BURKE AARON**, b. Ohio, 1837; educated at Hiram college, and in 1861 entered the Campbellite ministry, officiating in Cleveland and other places. In 1866 he was chosen assistant editor of the *Christian Standard*. In 1869 he was professor of history in Hiram college, and the next year became its president. He is the author of *Genuineness and Authenticity of the Gospel*; *The Evolution of the Theological and Doctrinal Systems of the Ancient Church*; and *Republican Text-Book for 1880*.

HINTON, **JOHN HOWARD**, 1791-1873; b. England; a Baptist preacher, and a zealous advocate of voluntary work in education and religion. He wrote *History and Topography of the United States*; *Elements of Natural History*; etc.

HIOGO, or **FIOGO**, a seaport of Japan on the island of Hondo, at the head of the gulf of Osaka. There is an excellent harbor, a town-hall, custom-house, government machine-shops, gas-light for the streets, and extensive trade.

HIPPARION, an extinct animal belonging to the horse family, and regarded by several modern naturalists as one of the links in the chain of evidence which supports the theory of the progressive development of creation, or the Darwinian doctrine of evolution. See HORSE, FOSSIL.

HIPPO, or **HIPPO REGIUS**, a city of Numidia, of which the ruins are yet to be seen, near the gulf of Bona, Algeria. Hippo was the residence of the rulers of Numidia, and in later years the see of St. Augustine. The Vandals destroyed the town in 431 A.D.

HIPPOCRATIC OATH, a formula ascribed to Hippocrates, and taken by persons entering the medical profession. By this oath they promised fealty to the profession and general good conduct in their lives. It is not dissimilar to the oaths of masonic and other societies at the present time.

HIPPOLYTUS, in Grecian mythology, the son of Theseus whose stepmother fell in love with him and accused him to his father because he was indifferent to her. Theseus caused Hippolytus to be murdered; but afterwards learned that he was innocent, whereupon the stepmother, the wicked Phædra, took her own life. The Romans asserted that Hippolytus was restored to life and was worshiped under the name of Virbins.

HIPPONAX, or **EPHEBUS**, a poet placed third, after Archilochus and Simonides, among the classic iambic poets of Greece. Expelled from Ephesus 540 B.C. by the tyrants Athenagoras and Comas, he took refuge in Clazomenæ. There his deformed figure and malicious disposition exposed him to the caricature of the Chian sculptors Bupalus and Athenis; and he revenged himself by issuing against them a series of bitter satires. These are in thought and execution much inferior to the similar works of his predecessor, Archilochus. His coarseness of thought and feeling, his rude vocabulary, his want of grace and taste, and his numerous allusions to matters of merely local interest, prevented his becoming a favorite in Attica. He invented epic parody, and the four opening lines of a parody on the *Iliad* have been preserved in Athenæus (xv. 698 B). He was also the inventor of a peculiar meter, used after him by many writers, known as the seazon or eholambus, which substitutes a spondee for the final iambus of an iambic senarius. [From *Encyc. Brit.*, 9th ed.]

HIPPOThERIUM. See HIPPARION.

HIRAM, a village in Portage co., Ohio, on the Atlantic and Great Western railroad; 33 m. s.e. of Cleveland; pop. of township, 1234. The village is the seat of Hiram college.

HIRAM (Heb. *Chiram*, high-born), King of Tyre, and contemporary with David and Solomon. He was David's friend and ally, and assisted him in the building of his palace with contributions of timber and labor. He also sent cedar and other timber, and skilled workmen for the building of the temple, and gave 500 talents for its adorning, being offered in return 20 towns in Galilee, which, however, he refused to accept. Later Jewish writers say that, because Hiram was a God-fearing man and helped the building of the temple, he was received alive into paradise; but after he had been there a thousand

years he sinned through pride, and was cast into hell. Another Hiram, son of a widow of the tribe of Dan, is conspicuous in masonic traditions.

HIRING (*ante*), in the United States, is a simple contract to do a certain thing for compensation, and all such transactions come under the legal regulations concerning contracts. If the party hiring out is incompetent, or neglectful, or loses or wastes property, wages may be withheld and discharge may ensue. In most of the states a person breaking a contract for service without reasonable cause can recover nothing, but in some states he can recover the actual value of his service. In case of a discharge before the end of the contracted time, if the person discharged is ready to perform the specified duty he can recover pay for the full period. In the hiring of chattels the person hiring is bound to use all reasonable care for the preservation of the article hired. He cannot dispose of it, for a mere hiring does not convey a title. If the hirer uses the article or animal for purposes not contemplated in the hiring, the owner may repossess and perhaps recover damages. In a general way it may be accepted that the obligations of the one who hires a thing and the one who lets it are on the basis of a plain contract, and it is understood that the purposes, services, and compensation have previously been agreed upon.

HIRPINI, a people of Italy who inhabited the s. portion of Samnium. They have been considered by some authorities as merely a Samnite tribe, while by others they are looked on as an independent nation. The country they inhabited was the wild and mountainous district traversed by the Sabatus, Calor, and Tamarus, tributaries of the Vulturinus, and on the e. side of the Apennine ridge, the upper course of the Aufidus. In the early history of Rome the Hirpini are found identifying themselves with their Samnite neighbors against their common foes. They seem to have been subdued in the early part of the 3d c. B.C., as in 268 B.C. Beneventum, the key of all their military positions, was colonized by Roman settlers. They appear in history for the first time as an independent people after the second Punic war. Revolting from their old conquerors, they joined the Carthaginian invaders, and though they were unable to recapture their stronghold of Beneventum, they remained faithful to Hannibal till the defeat at Metaurus restored the empire of Italy to his opponents. In the year of that event the Hirpini made peace with their old masters by betraying into their hands the garrisons of their allies. From this time till the outbreak of the social war, the Hirpini seemed to have continued steadfast in their allegiance. On that occasion, however, they set the example of revolt to the allies, and might have become formidable enemies, had not the rapid successes of Sulla induced them to repair their error by a complete submission. At the close of this war the Hirpini obtained the franchise, and do not again appear in history as an independent people. Their chief towns were Beneventum, Aeculanum, Trivicum, Equus, Tuticus, Murgantia, and Aquilonia.

HIRST, HENRY B., 1813-74; b. Philadelphia; became a lawyer and for some time a merchant, but better known as a writer of verses. *The Coming of the Mammoth, the Funeral of Time; Endymion, a Tale of Greece; and The Penance of Roland, and other Poems.*

HIRTIUS, AULUS, 90-43 B.C.; a personal friend of Julius Cæsar, under whom he served in Gaul, and who, in 46 B.C., nominated him as one of the 10 prætors. After the death of Cæsar he became consul, declared against Antony, and headed a reinforcement for Octavius. While leading an assault he was killed. It is said that he was the author of the eighth book of Cæsar's *Commentaries on the Gallic War*.

HISTIAËA, or **OREUS**, in ancient geography, an important city of Eubœa, on the n. extremity of the island, and giving name to the district Histiaiotis. It was very ancient, and, like most of the old cities of Greece, its origin is doubtful and obscure. At the final expulsion of the Persians from Greece, it passed into the hands of the Athenians, and when Eubœa revolted from that people and was again subdued, the old inhabitants of the town were expelled, and 2,000 Athenian colonists settled in their stead. It was at this date that the city changed its original name for that of Oreus, by which it was afterwards more generally known. At the end of the Peloponnesian war the descendants of the old inhabitants were restored by the Spartans, under whose dominion the city had fallen, and to whom it remained faithful till the battle of Leuctra, when it revolted from them. In the war between Philip and the Greeks, Oreus was frequently contested, and in B.C. 200 it was stormed by the Romans. Under them it gradually fell into decay. Some ruins of its fortifications are all that now remain to tell of its ancient greatness.

HISTOLOGY (*ante*). Although Malpighi and Leuwenhoek, Ruysch, Lieberkühn, and others, made several discoveries of minute parts with lenses, histology, as a science, did not commence until Bichat brought to bear upon the subject the powers of his generalizing mind, although his work was accomplished with but little aid from the microscope. His great work, entitled *Anatomie générale appliquée à la Physiologie et à la Médecine*, appeared at Paris in 1801. He was the first to classify tissues according to their structure. After Bichat came the epoch of histological research, which was the extension of the microscopic observations of Malpighi and Leuwenhoek in accordance with the general system of Bichat. The discovery of the method of combining lenses

so as to render them achromatic gave a new impulse to the study, and a more perfect classification of the tissues of the body was the result, as it placed in the hands of Schwann an instrument which, although a few errors were unavoidable in so new and profound a science, enabled him to demonstrate the law that all tissues have their origin in cells. This may be called the greatest discovery in histology, and therefore Schwann is often called the founder of the science of histogenesis, or the study of the origin of tissues, more recently pursued with such great success by Reichert, Koelliker, Remak, and others. Then the microscopic anatomy of diseased structures and their mode of development came to be investigated, and the science of pathological histology took its rise. Johannes Müller is regarded as the father of this branch of histology, as he indicated the general direction in which the investigation of diseased growths should be pursued. Afterwards Virchow, in the publication of his celebrated *Cellular Pathology*, added new luster to the science, which has recently been still further enriched by the labors of Bilothe, Rindfleisch, Recklinghausen, Cohnheim, and others. Now the science of histology enables the student to detect the elements of tissues in any organ, and also the first stages in the process of morbid growths by which the cell element gradually undergoes its transformation from a normal and healthy to an abnormal and sometimes malignant factor.

This brief historical notice needs only to be followed by a general view of those elementary tissues which it is the province of the science to investigate, and the study of whose functions forms so large a part of the science of physiology. In general terms, all tissues may be said to consist of cells, of one form or another. In cartilage the cells are globular or ellipsoidal, in the liver polygonal, in connective tissue long and spindle shaped. It was at first supposed that the elementary cell was composed of a little bag filled with fluid or solid matter, but now most histologists regard it as a small globular mass of living matter, or protoplasm, and this may have a nucleus, or exist without it. In regard to the power elementary cells may have of taking on different forms and becoming converted into different tissues, there is no certainty of knowledge. Whether the mature cells which form the various tissues have different natures in the first stages of their existence, or whether they are the results of transformations, cannot, perhaps, be determined; but it is more probable that each organ or tissue is made up of cells that are originally different; and it is by the development of this originally different organism, different not in form, perhaps, in any way that can be distinguished by the senses, but different in nature, that a primordial muscle cell will take to itself nutriment from the blood plasma, and become in time a fully developed muscle cell, and, in connection with the nerves distributed to the part, perform its ordained functions; that a hepatic cell, existing at first as a blastemic point in the evolving organ, passes in the same way through the various stages of its development, till finally it becomes the mature hepatic cell, and never becomes anything else physiologically: it cannot change to any other tissue, unless it passes under the power of malignant disease, and turns to a cancer or a sarcoma cell, or degenerates from loss of vital power. Human tissue elementary cells vary in size, from $\frac{1}{1000}$ to $\frac{1}{16000}$ of an inch in diameter, of a more or less ellipsoidal form, often nearly globular. There are two modes of cell growth, the endogenous, in which young cells form within the parent cell, and the exogenous, which takes place by a process of division; and this forms one of the grounds for believing that the cells of any tissue are always the cells of that particular tissue and no other. The most universal of all the elementary tissues of the body is connective tissue. As its name implies, it forms the connecting bond which holds together the special elements of the several organs, passing between and around them. The cells which form the special part of each organ can generally be distinguished with the aid of the microscope, varying widely in many instances, slightly in others. The organs, however, contain many tissues in common. They may in common have mucous membrane, but the cellular structure of this membrane differs in different organs. So far a special cellular element probably has the power of transformation, adapting itself to circumstances; but such transformation is different from that which would take place if an embryonic cartilage cell became an epithelial cell. Histology not only embraces the study of structural elements, but also elements of composition, or chemical elements, as well of the organs themselves as of their products. In this article no attempt can be made to do more than give an outline of what the science of histology is; the histological elements of many of the parts of the organs of the human body are given under their appropriate titles. Nothing has been said in this place of vegetable histology, although that science has existed longer, perhaps, than animal histology, and, being more simple, has been carried almost to perfection, while animal histology is scarcely out of its infancy; at least it is so immature that the results of its final development cannot be foretold.

HISTORY, a narrative of events and of the lives and acts of men, of families, of tribes, and of nations. History first took the form of tradition, and was handed down orally from generation to generation. Much of this tradition was obscure and mythical, assuming the form of religious belief. Written history is as old as the invention of letters, and among the earliest monuments were sculptured inscriptions and records of the acts of rulers, especially their victories. The oldest known historical writings are on

the monoliths, temples, and pyramids of Egypt, the cuneiform inscriptions of Assyria, and those found in the ruins of ancient Greek and Phenician towns. The history of ancient Egypt, so far as recorded, extends from about 4,000 years to 700 B.C., about the time of the dissolution of the empire. Near the close of the 5th c. B.C., Herodotus, the "father of history," was born, and his works are, so far as known, the earliest that can be classed under the name. It is usually supposed that he wrote, or meant to write, a universal history, but such was not the result; it was rather a partial history of the wars between Greece and the barbarians, with incidental geographical information attached.

Thucydides, the second great historian, was of a different order of mind. He approached the study of history from a philosophical standpoint, endeavoring to explain the actions which he recorded, while Polybius enlarged and improved upon the plan of Thucydides. The historians of Greece and Rome usually confined themselves to plain narrative, as Xenophon in his *Anabasis*, Cæsar in his *Commentaries*, and Livy in his more extended history. Tacitus alone showed distinct purpose in his work, lending his genius to the portrayal of tyranny in its blackest colors. Eusebius was the first great ecclesiastical historian. Procopius can be regarded only as a chronicler, neither scrupulous nor exact in his stories. Few historians appeared between the fall of the Roman empire and the middle ages, but the mental activity of the 12th c. and the invention of printing brought many into the field, and as facilities increased and the intercourse between nations became more frequent, we find a corresponding tendency towards historical writing. In regard to style, Machiavelli and Guicciardini were long considered models of composition. Later historians, however, while imbibing the spirit of their writings, formed styles of their own, in accordance with the prevailing tendencies of their respective ages. De Thou in France, Mariana in Spain, Strada, the Dutch historian of the Low Countries, and sir Walter Raleigh, with his wonderful chronicles of fresh discovery, are all authorities to be recognized and consulted, while in more modern days appeared Hume and Robertson, and the greater Gibbon, the writer of the *Decline and Fall of the Roman Empire*, one of the most stupendous historical works ever produced.

The tendency of modern history is critical rather than merely narrative. Philology and archaeology have very materially altered the reading of the histories that have come down to us, and in which the world has placed implicit faith. When the Bible is subjected to the ordeal of a new translation, we can hardly expect human history to escape. But if much that we have hitherto accepted as substantial is found to be mythical, it by no means follows that the main facts of history, as we have received them, are likely to be overthrown. Many of the histories written within the last half century are wonderful monuments of critical research. Authors are no longer content to accept the popular relation of occurrences without at least endeavoring to understand the motives which led to them and the effects produced by them. In these days the historian is no longer a mere reporter; he must be prepared to analyze character and to weigh events. He must seek his materials at the fountain-head, must compare the private with the public actions of the characters he portrays, and present to his readers a picture of men and women which shall be accurate in minute detail, and yet embrace the remoter consequences of their actions.

The origin of history may be attributed to that spirit of conservatism, largely inherent in human nature and readily developed in the progress of civilization, which incites to the preservation of a record of human life, its acts and occurrences. Our familiarity with the past is derived in the first instance from tradition, and later through the perpetuation of tradition and also of contemporary occurrence, by means of mural or monumental sculptures, inscribed tablets, or such other means as were feasible to those who desired to form the record. Naturally the first efforts in this direction were towards the preservation of a narrative of single events. These were sometimes incidents in natural phenomena of a startling nature—as floods, earthquakes, eclipses, etc.—and at others relations of momentous events in the lives of prominent individuals, usually potentates or wise men. Restricted by the means at hand, such a record was of course for a long time fragmentary and episodic. Bricks or tablets, the walls of buildings, and monumental piles served for the material, as symbolic or representative figures of birds, animals, and other suggestive objects answered for the manner. The first step in advance was taken when the discovery of the possible use of papyrus gave opportunity for the introduction of the elements of continuity and sequence into the preservation of intelligence, and actual history began. At first this took the form of annals, or chronicles, and it was not until after the middle ages that this form was abandoned for a more philosophical and systematic method of construction. And certainly the most charming and instructive works which undertake the purpose merely of bringing the future into contact and acquaintance with the past are those of the chroniclers of the middle ages. The names of Froissart, Monstrelet, Geoffrey of Monmouth, Matthew Paris, Holinshed, and the rest, should be remembered with reverence, and their writings studied with earnest appreciation. For these were the men who revived the historic element, after it had lain dormant during the stagnant period of the dark ages. To them, groping conscientiously, but naturally infused with the superstition and credulity of their time, we are indebted—not only for the histories which

they wrote, after much severe and painstaking labor, but also for the encouragement which they afforded to future writers, and for the existence of the later and greater historical efforts which they made possible. And it would be doing injustice to a most important class of workers not to mention the writers of *memoirs*. It is to the authors of the long series of works of this character, covering a large portion of the history of France, that we owe the preservation of a knowledge of events, and of the character of prominent personages, absolutely essential to the writing of a complete French history. Indeed those mousing investigators who spend their lives in searching out the truth of narration, in recording anecdotes and current manners and customs, and in generally contemplating the minor details of life with a view to the preservation of some accurate account of them, are of inestimable service to the historian. History, however, is of two kinds—narrative and philosophical. And it should be remembered that of these two species of history the latter is far the more important. "History," we are told, is "philosophy teaching by example." Merely narrative history is of no value whatever, of however much interest it may be in the way of satisfying a perfectly justifiable curiosity, except in so far as it teaches the lessons afforded by experience, and enables succeeding generations to profit by the lives of those which preceded them. It is, therefore, that species of history whose deductions from the events it records serve as a basis for the discovery and formulating of natural social laws, that possesses real value for humanity. Modern, like ancient, historians have generally become more justly famous for the vigor or polish of their style, the care they have displayed in the collection of their material, and the comprehensiveness of their design, than for philosophical analysis of the natural causes and bearing of the actions of men. Henry Thomas Buckle and Herbert Spencer are instances of the philosophical historian, as Sismondi, Thiers, Michelet, Hume and Smollett, and Bancroft are of the strictly narrative. Such writers as Macaulay, Prescott, Motley, and Froude have displayed the romantic side of history, and have discovered the possibilities of language in rendering its record glowing and fascinating, without departing from the limits of veracity. As history is but the combination and interweaving of human biography, it follows that works of a biographical character are among the most important implements of the historian. So also the division of history by classification—as of literature, ecclesiastical, history of art, bibliography, which is the history of books, etc.—aids greatly in modifying the mechanical labors of the historian, and enables him to give more time and thought to the philosophy of the events and lives he chronicles, and thus evolve from them their true merit, and usefulness to man.

HITCHCOCK, a co. in s.w. Nebraska, on the Kansas border, intersected by Republican river; 720 sq.m.; pop. '80, 1012. The surface is chiefly prairie. Co. seat, Culbertson.

HITCHCOCK, **ETHAN ALLEN**, b. Vt., 1798; a graduate of West Point, and instructor of infantry tactics. He served in the Mexican war, and afterwards commanded the military division of the Pacific. In the war of the rebellion he was maj.gen., of division and was one of the commissioners for interchange of prisoners. He was also one of the commissioners for the revising of the military codes. He has published *Remarks on the Alchemists; Swedenborg a Hermetic Philosopher; Christ the Spirit*, etc. He died in 1870.

HITCHCOCK, **ROSWELL DWIGHT**, D.D., LL.D., b. Maine, 1817; graduated at Amherst, where he was afterwards a tutor. In 1845 he became pastor of a Congregationalist church; in 1852 professor of natural and revealed religion in Bowdoin college, and in 1855 professor of church history in the New York Union theological seminary. In 1871 he was chosen president of the Palestine exploration society. He was one of the editors of the *American Theological Review*, and has published a *Complete Analysis of the Bible*, and other works. In 1880, after the death of rev. Dr. William Adams, Dr. Hitchcock was chosen his successor as president of the seminary in which he is also a professor.

HITCHCOCK, **SAMUEL A.**, 1784-1873; b. Mass.; the founder of the Hitchcock free high-school at Brimfield, and a liberal giver to Amherst and other colleges and to various charities. He gave in all more than \$650,000.

HITTITES, the descendants of Heth, one of the children of Canaan, the grandson of Noah. 1. *Notices of them in the Scriptures*. In the account of the settlement of nations after the flood the Canaanites are said to have been "spread abroad" and to have extended over the land of Palestine from Sidon on the n. to Gaza on the south. Their subsequent history shows that their spreading abroad was also far beyond those bounds. The children of Heth sold the field and cave of Machpelah to Abraham. Two of the daughters were wives of Esau. Among their towns one was named "the city of instruction" and "the city of the book"—titles implying an acquaintance with letters, and remarkable in connection with the inscriptions by which the course of their migrations is now traced. At the time of the conquest of Canaan by Joshua they are mentioned as among the possessors of the land, dwelling with the Jebusites and Amorites in the mountains, and extending their dominions to the river Euphrates. At a later day two of them are named among the personal attendants of David: Abimelech, who

went down with him into the camp of Saul, and Uriah, who was one of the thirty that constituted his guard. Solomon imposed tribute on them in common with other Canaanitish nations. In his day it is recorded that they were accustomed to buy horses and chariots in Egypt. That they continued in Palestine during and after the captivity appears from the statement in Ezra that some of the returned Jews married Hittite women. Though no particulars are recorded in Scripture concerning their religion, its idolatrous character is declared, since among Solomon's idolatrous wives Hittite women were included, and on the tribe, in common with the other inhabitants, are charged the abominations that defiled the land.—II. *Notices found in ancient inscriptions.* 1. On Egyptian monuments, in the time of Rameses II., 1306 B.C., Hittites are conspicuous among the eastern enemies of the Egyptians. This portion of them corresponds with those who are spoken of in Scripture as living beyond the bounds of Palestine. One of their cities, called Kadesh, "the holy," was near a lake, now named Kedes, fed by the Orontes s. of Emesa. The city is also described as being in the land of the Amorites, to which Carchemish, too, on the w. side of the Euphrates, belonged. Their country, consequently, was in the valley of the Orontes. Rameses II. boasted that he defeated this people with their allies, and commemorated the so-called victory on a papyrus roll, as well as by sculptured inscriptions, in which many tribes are mentioned as allied together who evidently did not dwell in Palestine. The Hittites are represented as having a regular army composed of disciplined infantry, cavalry, and 2,500 chariots, each drawn by two horses, and carrying a charioteer and two warriors. This army contained men of two tribes, one bearded and the other smooth-faced, and differing in dress and arms; yet both described under one name and as united in a common cause. The fact, however, that in the 21st year of Rameses II. the great king of the Hittites went to Egypt and made a treaty of peace seems to favor the claim set up for the allies that they were not defeated by the Egyptian king but, on the contrary, forced him to sign a treaty, the terms of which were not unfavorable to them. A copy of a treaty, preserved in a hieroglyphic inscription, gives some information concerning the religion of the Hittites, describing their gods of war, of women, of mountains and rivers, with special mention of Ashtaroth in connection with a god of another name that corresponds with Baal. 2. In the Assyrian inscriptions there are references to a nation having a name that corresponds with the Hittites, and consisting of a confederacy ruled by 12 chiefs. Their territory was in the valley of the Orontes, and they were aided by people of the sea-coast, probably the Phenicians. Inscriptions, in what are recognized as Hittite characters, have been found on clay impressions of seals in Sennacherib's palace at Nineveh; in the walls of buildings at the ancient Hamath; in a rock-sculpture at Ibreez, in Lycæonia; at Carchemish; at Boghaz Keui and Eyuk, on the eastern side of the Halys; at Ghiaur Kalesi, in Phrygia; at Karabel, in Lydia; in the Taurus; and near Antioch. These various monuments indicate that the Hittite empire once extended from Carchemish, their capital, to the shores of the Ægean; and that two roads traversed it: one used by Cæsus in his march against Cyrus, and the other, along the s., the route of Xenophon and "the ten thousand." As the Assyrian empire rose that of the Hittites declined. Their provinces in Asia Minor were lost first, and afterwards their possessions in southern Syria. Kadesh on the Orontes, once their capital, and Hamath fell into Semitic hands; and, at last, Carchemish was taken by Sargon, 717 B.C. The double eagle is shown by the sculptures to have been a Hittite symbol. It was adopted by the Seljukian sultans in the 11th c., was brought to Europe by the crusaders, and used by the German emperor in 1345.

HITTORF, JACQUES IGNACE, 1793–1867; b. Germany; in 1810 a pupil of fine arts in Paris, and in 1818 architect for the government. He was long engaged in the construction of public edifices, such as the church of St. Vincent de Paul, and the embellishment of the Bois de Boulogne and the Champs Elysées. He wrote several works on architecture.

HIZEN. A province in Kiushiu, Japan, famous for its porcelain manufactures, which are chiefly at or near Arita (see ARITA); pop. 1,074,461. It contains the large cities of Nagasaki and Saga.

H'LISSA. See LISSA.

HOADLEY, BENJAMIN (*ante*), 1676–1761; b. England; bishop of Bangor in 1715; of Hereford in 1721; of Salisbury in 1723; and of Winchester in 1734. He attracted much attention at first by his controversy with bishop Atterbury in 1709, when he was rector of Streatham. The house of commons were so pleased with the manner in which he defended himself against the tory Atterbury that Hoadley's name was mentioned in the address to the queen as a champion of liberty, both civil and religious. He developed his principles in his tract on the *Measure of Obedience to the Civil Magistrate*. When in 1714 queen Anne was succeeded by George I., the tories ceased to be in favor at court. In 1715 Hoadley was raised to the bishopric of Bangor; and in 1717 the celebrated *Bangorian controversy* arose. It began by Hoadley's publication of his views on the text, "My kingdom is not of this world;" in regard to which he maintained that Christ had left behind him no such authority as that claimed by churches, and that this was the best way of answering the arrogant pretensions of the church of Rome. These views gave great offense both to high church and dissenters. He was attacked from all quar-

ters. William Law is considered his ablest antagonist. The controversy raged for three years. From his *Discourses on the Terms of Acceptance*, it is obvious that he rejects the five points of Calvinism. He wrote an account of the *Nature and End of the Sacrament*, and a *Letter to Clement Chevalier*.

HOADLEY, JOHN, 1711-76; son of Benjamin; educated at Cambridge, and was chaplain to the prince of Wales, prebendary of Westchester, and rector of St. Mary's. He wrote *Love's Revenge*, a pastoral; *Jephtha*, an oratorio; *Phæbe*, and the *Forces of Truth*, and edited his father's writings.

HOANG-HAI. See WHANG-HAI, *ante*.

HOANG-HO. See WHANG-HO, *ante*.

HOAR, EBENEZER ROCKWOOD, LL.D., b. Mass. 1826; graduated at Harvard, and in 1840 was admitted to the practice of law. He was appointed a judge, but resigned in 1855. Four years later he was made a supreme court judge, and held the seat until 1869, when he became U.S. attorney general, in which office he made many important improvements, raising it to the rank of a district department of the government, known as the department of justice. In 1872 he was elected to congress.

HOAR, GEORGE FRISBIE, b. Mass. 1826; a son of Samuel; graduated at Harvard in 1846; in 1849 began the practice of law at Worcester. In 1868 he was chosen a member of congress, and was re-elected three successive times. In 1876 he was chosen a senator of the United States. In 1880 he was president of the republican national convention at Chicago for the nomination of president and vice president of the United States.

HOAR, SAMUEL, LL.D., 1778-1856; b. Mass.; graduate of Harvard, admitted to the bar in 1805, and soon became a conspicuous lawyer. He was in the constitutional convention of 1820; a state senator in 1825; afterwards a state councilor, and in 1835 a member of congress. In 1844 he was sent by the Massachusetts legislature to South Carolina, to dispute before the courts the constitutionality of certain laws of that state authorizing the imprisonment of free negroes coming into the state. He was, however, not allowed to plead, but was forcibly expelled from Charleston by the public authorities, the South Carolina legislature by special act authorizing the expulsion.

HOARE, SIR RICHARD COLT, 1758-1838; b. England; inherited a large fortune, and turned his attention exclusively to literature and art. He traveled over Europe, Ireland, and Wales, collecting a great number of sketches, and publishing accounts of portions of his tours. His principal work was an elaborate history of Wiltshire, profusely illustrated, which was not completed at his death.

HOARE, WILLIAM, 1707-92; b. England; a painter of eminence, one of the earliest members of the royal academy. He produced some altar pieces, and portraits of William Pitt, Grenville, and other noted statesmen.

HOBART, JOHN HENRY, S.T.D., 1775-1830; b. Philadelphia; graduated at Princeton, where he became a tutor, and a student of theology. He was ordained a deacon of the Protestant Episcopal church in 1798, and was subsequently a pastor in New Jersey and on Long Island. In 1812 he was assistant rector of Trinity church, New York, and in 1816 was chosen rector of the church and bishop of the diocese. He was one of the founders of the general theological seminary in which he was professor of pastoral theology. In 1823 he traveled in Europe studying the social and moral condition of the people. In London he published two volumes of sermons directed against the observance of forms to the neglect of essentials. He was a zealous supporter of episcopacy, and opposed the union of denominations and such organizations as Bible and tract societies. Among his works are, *Apology for Apostolic Order*, *The State of the Departed*, and various devotional manuals.

HOBART PASHÁ, admiral of the Turkish fleet, third son of the earl of Buckingham, his real name being Augustus Charles Hobart, was b. April 1, 1822. Entering the British navy in 1836, he distinguished himself in the Crimean war and rose to the rank of captain. Being of an adventurous turn, he took command of a blockade runner during the war of the southern rebellion. In 1867 he offered his services to the sultan, who gave him command of the fleet operating against Crete. He took this step without asking leave of the British admiralty, and in consequence of the remonstrances of the Greek government his name was stricken from the British navy list; but afterwards, upon his own plea that he was serving an ally of the British government, and that he had contributed to maintain the peace of Europe, he was restored to his former rank and placed upon the retired list, with the opportunity of rising by seniority to the rank of a retired admiral.

HOBBEMA, or HOBBIMA, MINDERHOUT, or MINARD, a landscape painter of the Flemish school, b. Antwerp about the beginning of the 17th century. His personal history is a total blank. The only fact in it that can be relied on as even approximately true is that he died at a very advanced age in 1699. His landscapes, which are now rather rare, are extremely simply in their structure; but his management of perspective, and his conduct of chiar-oscuro, enable him to express vast distances in a few square feet of canvas, and to imprint a distinctive and marked character upon the homeliest scenes. His execution is wonderfully careful, yet so well harmonized, and

so light and graceful, that each separate piece is in itself a perfect gem of art. His style bears so strong a resemblance to that of Ruysdael that many of his pieces pass under that artist's name.

HOBHOUSE, JOHN CAM. See **BROUGHTON**, lord.

HOBOKEN (*ante*), a city in Hudson co., N. J., on the Hudson river, opposite New York; pop. '70, 24,766; in '80, 30,999. It is substantially a section of Jersey city, and was for many years a rural district of great beauty, and one of the chief pleasure resorts for citizens of the metropolis. In recent years it has been thickly peopled with Germans, and has quite lost its rural character. It is the landing place of several lines of European steamers, the terminus of a number of railroads, and has a great number of manufactories, including foundries, breweries, machine shops, iron works, etc. Among its institutions are St. Mary's hospital, the Martha institute, and the Stevens institute of technology. The latter was founded by E. A. Stevens, who presented a building site and a fund of \$650,000. It has also an academy, a seminary for girls, and many excellent schools. The city (chartered in 1855) is lighted with gas, and furnished with water from the Passaic river. It was settled by the Dutch soon after their establishment in New Amsterdam (now New York).

HOCHELAGA, a co. in the province of Quebec, Canada, occupying 76 sq.m.; on the e. part of the island of Montreal; pop. 25,640. The capital is Longue Pointe.

HÖCHST, a t. in Hesse-Nassau on the Frankfort and Mentz railroad, 5 m. w. of Frankfort; pop. 4,055. The people are engaged in various manufactures. In June, 1822, Tilly won a battle here over duke Christian of Brunswick, and in 1795 the French were here defeated by the Austrians.

HOCKING, a co. in s. Ohio on the Hocking river, intersected by the Columbus and Hocking valley railroad and a canal; 380 sq.m.; pop. '70, 17,925. It has a hilly surface and is partially covered with forests. There are iron and coal mines, but the chief productions are corn, wheat, oats, wool, and pork. Co. seat, Logan.

HOCKING, or **HOCKHOCKING**, a river in Ohio, near the middle of the state, running through a picturesque region and emptying into the Ohio. Boat navigation is possible for about 70 m., but beyond that distance are many falls and dams. The Hocking canal passes along one of the shores.

HODEIDA, or **EL HUDAIDAH**, a port in Arabia on the Red sea, 100 m. above Mocha, much visited by pilgrim ships from the east. The harbor is shallow, but there is considerable trade in coffee and India goods. It is the seat of the Turkish governor of Yemen.

HODGE, ARCHIBALD ALEXANDER, D.D., b. N. J., 1823; graduated and was a tutor at Princeton; in 1847 a missionary in India under the charge of the American board. He returned in 1850 and settled as pastor in Maryland, Virginia, and Pennsylvania. In 1864 he became professor of theology in the western theological seminary at Allegheny city, and in 1877 at Princeton. He is the author of *Outlines of Theology*, *The Atonement* and *Presbyterian Doctrine Briefly Told*, and other works.

HODGEMAN, a new co. in w. Kansas on the Pawnee fork, a branch of the Arkansas. Organized after the census of 1870.

HODGES, WILLIAM, 1744-97, an artist who was with capt. Cook on his second voyage to the Pacific, and made the illustrations for Cook's narrative. He was afterwards in India under the patronage of Warren Hastings.

HODGSON, JOHN EVAN, b. London, 1831; educated at Rugby, and in 1852 became a student of art at the royal academy. His first picture was exhibited in 1856, since which time he has been a regular exhibitor. He first painted domestic and contemporaneous subjects, but afterwards excelled in historical pictures from 1861 till 1869, when his visit to n. Africa interested him in subjects of Moorish life, to which he has since chiefly confined himself. His principal pictures are—"Arrest of a Poacher," "Canvassing for a Vote," "Sir Thomas More's Daughter in Holbein's Studio," "A Rehearsal of Music in a Farm-house," "Return of Sir Francis Drake from Cadiz," "First Sight of the Armada," "Queen Elizabeth at Purfleet," "Taking Home the Bride," "Jewess Accused of Witchcraft," "Chinese Ladies and European Curiosities," "Roman Trireme at Sea," "Arab Story-Teller," "Arab Prisoners," "The Basha's Black Guards," "The Outpost," "An Arab Patriarch," "Army Reorganization in Morocco," "The Snake Charmer," "A Fair Customer," "Jack Ashore," "A Tunisian Bird seller," "A Needy Knife-grinder," "Returning the Salute," "Odd Fish," "A Barber Shop in Tunis," "The Talisman," "The Temple of Diana at Zaghouan," "Better have a New Pair," "Following the Plough," "Commercial Activity in the East," "Pampered Menials," "Relatives in Bond," "An Eastern Question," "Lost," and "The Pasha."

HOE, RICHARD MARCH, b. New York, 1812; the son of an English inventor. He is known all over the world for his many valuable improvements in printing presses, of which he is the leading manufacturer. He went to England in 1837 to patent an improvement in the manufacture of saws, and his visit enabled him to perfect improvements in printing machinery which were adopted largely in England as well as in

America. In 1846 he invented the "lightning press," named from the wonderful rapidity of its work.

HOEI-SHIN, or HUI-SHÊN, a Buddhist monk of China supposed to have lived about the close of the 5th c. A.D., and to have traveled in foreign lands, which might be western North and South America. He said that iron was not to be found in these countries; that gold was not esteemed, and was of no value in commerce. He also asserts that he found Buddhist institutions already established.

HOFFMAN, CHARLES FENNO, b. New York, 1806; educated at Columbia college, at the age of 21 admitted to the bar, and about the same time became a writer for newspapers. When the *Knickerbocker Magazine* was started he was for a few months the editor. In 1835 he published *A Winter in the West*, and two years later *Wild Scenes in the Forest and the Prairie*. In 1840 he published *Greyslaer*, a novel. But his fame rests chiefly upon his poems. Thirty years ago he became afflicted with mental disease, and has since lived in an asylum.

HOFFMAN, DAVID, LL.D, 1784-1854; b. Md.; in 1817 professor of law in the university of Maryland. After 1836 he traveled for a time in Europe, and sent a number of articles relating to the United States to a London paper. He published *A Course of Legal Study; Legal Outlines; Viator; Chronicles selected from the originals of Cartaphilus, the Wandering Jew; and Miscellaneous Essays*.

HOFFMAN, MURRAY, 1791-1878; b. New York; graduated at Columbia college, and became one of the foremost of lawyers. In 1839 he was assistant chancellor, and in 1853 judge of the supreme court. His legal publications are numerous and valuable. Among them are *Office and Duties of Master in Chancery; Vice Chancery Reports*; and three books on ecclesiastical law and custom.

HOFFMAN, OGDEN, 1799-1856; b. New York; graduated at Columbia college; served in the second war with England as a midshipman; was admitted to the bar, and made a great reputation as a lawyer in New York. In 1837, and again in 1848, he was elected a member of congress, and in 1854 was attorney-general of New York state.

HOFFMAN, WILLIAM, b. New York, 1807; a graduate of West Point; served in the Black Hawk and Florida Indian wars, and in the war with Mexico. In the war with the rebellion he was commissary gen. of provisions. In 1870 he was retired from service with the rank of col. and brevet rank of maj.gen.

HOFFMANNSEGG, JOHANN CENTURIUS, 1766-1849; b. Dresden; studied at Leipsic and Göttingen, and became celebrated as a botanist. He discovered and described a great number of new plants, and made valuable contributions to entomology.

HOHFIOF, or EL-HOFHOF, the capital of the province of Lahsa Arabia, near the Persian gulf. Pop. 24,000. The fortifications once formidable are now in ruins. There are mosques and inclosed gardens, and all the features of an eastern town.

HOFLAND, BARBARA, 1770-1844; b. England, the daughter of a manufacturer. She published a volume of verses in 1805, and three years later married Hofland, the artist (her second husband). She published over 70 separate works, of which the larger portion were for young people. Some of the more notable were *The Daughter-in-Law, The Czarina, The Clergyman's Widow*, and *The Son of a Genius*.

HÖFLER, KARL ADOLPH KONSTANTIN, b. Bavaria, 1811; graduated at Munich, and studied in Italy. In 1836 he was the editor of the official gazette at Munich, and in 1840 professor in the university. In 1851 he was professor of history at Prague. He has written a number of works on political and historical subjects.

HOFMANN, AUGUST WILHELM, F.R.S., a distinguished living chemist, b. at Giessen in 1818. After obtaining the degree of doctor of philosophy, he became assistant to Liebig, in the Giessen laboratory, and subsequently he was appointed extraordinary professor of chemistry in the university of Bonn. When the royal college of chemistry was established in London in 1845, Hofmann was recommended by Liebig as highly-qualified for the important post of superintendent to the new institution. This college, which has since merged into the laboratory of the royal school of mines, owes much of its high character to his teaching and his scientific reputation. On the elevation of prof. Graham from the post of chemist to the mint to the office of master of that institution, Hofmann was appointed his successor. In 1865 Hofmann accepted an appointment to be professor of chemistry in the university of Berlin, with the commission to found a chemical institute. He was a juror at all the international exhibitions (London, 1851 and 1862; Paris, 1865 and 1867). In conjunction with Dr. Benze Jones he edited the later editions of Fownes's *Manual of Chemistry*. His numerous contributions to the *Annalen der Chemie und Pharmacie*, to the *Transactions of the Chemical Society*, and to the *Philosophical Transactions of the Royal Society*, are for the most part on the very highest departments of organic chemistry; and in 1854 a royal medal was awarded to him for his *Memoirs on the Molecular Constitution of the Organic Bases*. It was in the course of these researches that he discovered in coal-naphtha aniline, the basis of the new colors mauve and magenta which had previously been only obtained from indigo. For his practical applications of this discovery, one of the great prizes

was awarded to him at the Paris exhibition of 1867. Hofmann's *Introduction to Modern Chemistry* (1865; 5th ed., 1871) has led to great reforms in the teaching of chemistry.

HOGAN, JOHN, 1809-58, b. Ireland; studied sculpture in Rome, and received high praise from Thorwaldsen for his "Drunken Faun." He received a medal at the Paris exhibition of 1851.

HOHENLOHE, a princely family of Germany, formerly in possession of the Hohenlohe principality, which was mediatised 1806. The ancestry of this noble house dates back to the early dukes of Franconia, and it was at first divided into two branches, the Hohenlohe-Hohenlohe, and the Hohenlohe-Speckfeld; but the former was soon extinct, the last descendant dying in the fourth generation. Of the descendants of the Hohenlohe-Speckfeld branch, Georg, reigning duke in 1551, left two sons, who founded respectively the families of—I. Hohenlohe-Neuenstein-Oehringen, which died out in 1805, and of Hohenlohe-Neuenstein-Langenbourg, now subdivided into Hohenlohe-Oehringen, and Hohenlohe-Langenbourg; II. The branch of Hohenlohe-Waldenburg, since divided into Hohenlohe-Bartenstein, and Hohenlohe-Schillingsfurst. Of the elder branches, FREDERICK LUDWIG, prince of Hohenlohe Ingelfingen (1736-1818), distinguished himself at the battle of Weissenberg, and gained the victory at Kaiserlauten; but after the defeat of Jena, 1806, he retired from active participation in the campaign. Of the younger branches, ALEXANDER LEOPOLD FRANZ EMERICH, descendant of the Hohenlohe-Waldenburg-Schillingsfurst family, is the best known (1794-1849). He was in priestly orders, and during the terrible epidemic fevers at Stuttgart, he devoted himself to the sick, and did much by his eloquence, both there and in Munich, to revive religious feeling. Miraculous cures were attributed to him, one of his first patients being the princess Schwarzenberg, a paralytic. His fame was increased by his sudden cure of an American lady, Mrs. Mattingley, at Washington, 1824. He published many controversial works, but did not succeed in obtaining the papal sanction for his treatment of disease. Another descendant of the same branch is the Bavarian statesman, KARL VICTOR, born 1819, one of Bismarck's firmest adherents, a member of the reichstag, and in 1871 its vice-president. He was a strong advocate of German unity, and although he was one of the first to introduce the Prussian military system into Bavaria, he favored the South German confederation. The present representatives of the family are, for the *Neuenstein branch*:

I. HOHENLOHE-LANGENBURG, Prince Hermann-Ernest-François-Bernard; married princess Leopoldina of Baden.

II. HOHENLOHE-OEHRINGEN, Prince Frederic-William-Eugene-Charles, duke of Ujest; married princess Pauline of Ujest.

III. HOHENLOHE-INGELFINGEN, Prince Charles-Adalbert-Constantine-Henry, lord of Klein Dronowitz; born 1820.

IV. HOHENLOHE-KIRCHBERG, Princess Maria, countess of Urach.

For the *Waldenburg branch*:

I. HOHENLOHE-BARTENSTEIN, Prince John-Frederick-Michel-Charles-Marie.

II. HOHENLOHE-BARTENSTEIN-JAGSTBERG, Prince Albert-Vincent-Ernest-Leopold. For the *Hohenlohe-Waldenburg-Schillingsfurst branch*: Prince Frederick-Charles; married princess Therese of Hohenlohe-Waldenburg-Schillingsfurst.

HOJO, a family of twelve Japanese rulers who held military authority in Japan from A.D. 1219 to 1333, living at Kamakura. They were overthrown by Nitta Yoshisada in 1333. Under their direction, the great Mongol invasion of Khublai Khan was repulsed.

HOK'USAI (wrongly written Hokfusi or Hokesai) a Japanese artist who flourished during the first half of this century in Yedo, though he traveled largely over his native country sketching scenery, costume, and character; one of the ablest, most original, and versatile of the long roll of artists of Japan. His sketches have become familiar in Europe and America, since they have furnished magazine writers, artists, decorators, and designers in oil-colors, wood-engravings, silver-ware, embroidery, etc., with models, suggestions, and ideas. Hokusai's sketches are collected in the *Hokusai Tshon*, or series of albums embracing the entire range of Japanese pictorial art, and containing most of the stock subjects of Japanese artists. His *Fuji Hiakke* is a collection of "One Hundred Views of Fuji." See FUGI YAMA. See illustrations in Alcock's or Griffis's works on Japan, Jarvis's *A Glimpse of the Art of Japan*, Noah Brooks's articles in *Scribner's Magazine*, or any recent pictorial work referring to Japanese art or decoration.

HOLBROOK, JOHN EDWARDS, 1796-1871; b. S. C.; graduated at Brown university; studied medicine, traveled in Europe; practiced in Charleston, and became professor of anatomy in the state medical college. He published *American Herpetology, or Description of Reptiles of the United States*, and began an elaborate work on *Southern Ichthyology*.

HOLCOMBE, AMASA, b. Mass., 1787; a compiler of almanacs and teacher of engineering, surveying, and astronomy. In 1828 he began the making of telescopes, and was long without a rival in the United States. He was a member of the Massachusetts legislature, serving both in the house and the senate.

HOLCROFT, THOMAS, 1745-1809; b. England; the son of a shoemaker and a follower of the same trade. Turned his attention to horse-training, then became successively a schoolmaster, an actor, and lastly a writer for the stage. He produced several excellent plays, one of which, *The Road to Ruin*, still keeps the stage. In the time of the French revolution he was indicted for high treason, but was never called up for trial. Besides some 30 plays he wrote four novels, and translated Lavater's *Physiognomy* and some of the works of Frederick the great. He also wrote *Travels in France and Germany*.

HOLDEN, OLIVER, d. Mass., 1831; the author of the popular psalm-tune *Coronation* and of some other pieces. He published *American Harmony*, the *Worcester Collection*, and other books of music.

HOLLAND, a city in Ottawa co., Mich., on Black river, and the Michigan shore railroad, about 4 m. from lake Michigan; pop 2,469. It has a considerable number of manufactories, six churches, and four newspapers, two of which are in the Low Dutch language. A little lake 6 m. long, and of celebrated beauty, is near the city.

HOLLAND, JOSIAH GILBERT, b. in Belchertown, Mass., July 24, 1819. His father, whose character is sketched in "Daniel Gray," was equally willing and unable to help his ambitious son to rise above his own humble lot in life. After many struggles, however, he graduated with honor from the Berkshire medical college, in Pittsfield, in 1841. He showed talent for writing at an early age, and in 1847 founded the *Bay State Courier*, which he gave up at the end of six months, and passed a year in Vicksburg, Miss., as superintendent of public schools. In 1849 he accepted the position of assistant editor on the *Springfield Republican*, and two years later became one of the proprietors of that paper. It was in the columns of the *Republican* that his *History of Western Massachusetts* first appeared. He became widely known as a lecturer. In 1868 he went to Europe for two years, and it was during this trip that he conceived the idea of *Scribner's Monthly*, which immediately upon his return was carried into effect. In Nov., 1870, the first number appeared, amid many prophecies of failure because there was no room for such a publication. It made room, however, and *Hours at Home*, *Pittman's Magazine* and *Old and New* successively resigned to it their respective subscription lists. Dr. Holland resides in New York city, and spends the summer at his place called "Bonnicastle," on one of the Thousand islands, which he recently purchased. His works, some of which were published under the assumed name of Timothy Titecomb, are: *The Bay Path*, a novel; *Letters to the Young*; *Bitter Sweet*, a poem; *Gold Foil*; *Miss Gilbert's Career*, a novel; *Lessons in Life*; *Letters to the Joneses*; *Pain Talk on Familiar Subjects*; *Life of Lincoln*; *Kathrina*, a poem; *The Marble Prophecy*; *Arthur Bonnicastle*; *Garnet's Sheaves*, a poem; *The Mistress of the Manse*; *Serenocks*; and *Nicholas Minturn*.

HOLLAND, SIR NATHANIEL DANCE, 1734-1811; b. England; the son of George Dance, architect of the Mansion-house in London. He studied painting in Italy for several years, and on his return became distinguished, especially as a portrait-painter. After marrying a rich heiress, he relinquished his profession, and assumed the name of Holland, was made a baronet, and entered parliament. His portrait of Garrick in the character of Richard III. is one of his best works, and gives a good example of his style.

HOLLAND, PHILEMON, 1551-1636; b. England; the "translator-general of his age," as he was called by his contemporaries. He was educated at Trinity college, of which he became a fellow. On being appointed to the rectorship of the free grammar-school of Coventry, he began a long series of translations from the classics. He also found time to carry on a very considerable practice as a physician. By a proper use and distribution of his time he reconciled his three professions of schoolmaster, doctor, and translator, fulfilling the functions of all three with undiminished vigor and assiduity till his 80th year. His chief translations are those of Livy, Plutarch's *Morals*, Suetonius, Ammianus Marcellianus, and the *Cyropædia* of Xenophon. He also did good service to literature by his edition of Camden's *Britannica*, to which he made some valuable additions.

HOLLAR, WENCESLAUS or WENZEL, a celebrated engraver; b. 1607, in Bohemia. He was apprenticed to Matthew Marian, a pupil of Rubens and Vandyck, to learn engraving. He was only 18 when he published his first pieces, consisting of prints of the Virgin, the "Ecce Homo," and some other pieces. Leaving Prague he began a wandering life through Germany, taking views of the chief towns and of the most striking scenery of the Danube, Rhine, and other streams, which brought him great fame but no regular employment. Hollar's fortunes were at a very low ebb when he fell in with the earl of Arundel, who attached him to his service. Soon after reaching England with his patron he was appointed to instruct the prince of Wales in drawing; and in 1640 published his *Ornatius Muliebris Anglicanus, or the several habits of Englishwomen from the Nobility to the Countrywoman, as they are in these Times*. After the outbreak of the civil war he incurred the suspicions of parliament, and was imprisoned for a short time. Making his way to Antwerp, where lord Arundel was then residing, he wrought quietly and assiduously for print-sellers and publishers during several years. His pieces never having fetched prices at all proportionate to their merits, he was forced, in order

to make a living, to place a price upon his time. He fixed his tariff at fourpence an hour, which he marked by a sand-glass. So exact was he that when any one, even his employers, came to speak with him about the picture on hand, he always turned down his glass, charging payment only for the time he was actually engaged with his burin. It was in this humble way that he produced his fine engravings after Da Vinci and the great masters of portrait-painting. On returning to England after the restoration, Holcroft worked with the same unflagging industry, and with no more profitable result than in his younger days. His plates in Dugdale's *Monasticon* and *History of St. Paul's* attest his diligence. In 1669 he was commissioned by Charles II. to take plans and perspective drawings of Tangier and its fortifications, which, on his return to England, he engraved. His last known engravings are his unfinished illustrations of Throton's *Antiquities of Nottinghamshire*. These and other works occupied him till his 70th year, but without gaining for him an independence. On his very deathbed an execution was served upon his house. His last words were a petition to be allowed to die in his bed, and that he might not be removed to any other prison but his grave. It is not known whether this prayer was granted. He died in 1677.

HOLLEY, ALEXANDER LYMAN, b. Conn., 1832; graduated at Brown university, and was educated as an engineer at the Corliss steam-engine works. He was the first who introduced the Bessemer process into America, and built the first Bessemer-steel works in this country, erected at Troy, N. Y., and, at a later period, similar works at Pittsburg, Harrisburg, Chicago, and elsewhere.

HOLLIDAYSBURG, the seat of justice of Blair co., Penn., on a branch of the Juniata river, and a branch of the Pennsylvania railroad; pop. '70, 2,952. There is a large trade by rail and canal; coal, iron, and grain are the main products. There are several foundries, blast-works, and rolling-mills, and some other manufactures.

HOLLIS, THOMAS, 1659-1731; b. England; a rich merchant of London who made bountiful bequests to Harvard college, of which the Hollis professorship of divinity is a memorial. He was a Baptist, but all he required was that the professor should be of sound orthodox principles. In 1727 he provided for a professorship of mathematics and philosophy, and gave many books to the library. One of his nephews was also a donor to the college.

HOLLOWAY, THOMAS, 1748-1827; b. London; celebrated as an engraver. His chief work was in the illustration of Lavater's *Essays on Physiognomy*, for which he made about 700 plates. He also engraved some of Raphael's cartoons.

HOLLY SYSTEM OF STEAM HEATING. See WARMING AND VENTILATION.

HOLLY WATER-WORKS. See WATER SUPPLY.

HOLMAN, JAMES, 1789-1857; b. England; at the age of 23 he became blind, nevertheless he traveled in France, Italy, and Switzerland, and published his impressions in a book which was at once popular. He then undertook a journey around the world, starting from St. Petersburg; but he was arrested on suspicion of being a spy, sent across the frontier, and returned home. Between 1827 and 1832 he made a voyage around the world, and published an account of it in 1834. In 1843-44 he made a tour of the Danubian principalities and Transylvania.

HOLMBOE, CHRISTOPHER ANDREAS, b. Norway, 1796; distinguished as a philologist; in 1822 professor in Christiania university. He published philological works in Norwegian, Danish, German, French, and Latin.

HOLMES, a co. in n. w. Florida, on the Choctawatchie river; 470 sq. m.; pop. '80, 2,170-127 colored. The surface is level and the soil chiefly alluvial, producing corn, cotton, and sugar. Co. seat, Cerro Gordo.

HOLMES, a co. in w. Mississippi, on the Yazoo and Big Black rivers, crossed by the New Orleans, St. Louis, and Chicago railroad; 800 sq. m.; pop. '70, 19,370-13,225 colored. It has a level surface, with many cypress swamps and considerable forest land. Chief productions: cotton, corn, and pork. Co. seat, Lexington.

HOLMES, a co. in n. e. central Ohio, intersected by the Cleveland, Columbus, and Mount Vernon, and the Pittsburg, Fort Wayne, and Chicago railroads, and the Walhonding river; 420 sq. m.; pop. '80, 20,775. The surface is hilly and largely covered with forests; soil fertile. Chief productions: corn and pork. Co. seat, Millersburg.

HOLMES, ABIEL, D.D., LL.D., 1763-1837; b. Conn.; graduated at Yale, where he was a tutor and student of theology; in 1785 had charge of a parish in Georgia; resigned 1791 and settled in Cambridge, Mass., where he was pastor of the first parish for 40 years. His principal work was the *Annals of America*, an elaborate and careful chronology of American history. He also wrote *Life of President Stiles* (whose daughter he married).

HOLMES, GEORGE FREDERICK, b. British Guiana, 1820; educated in England, in 1838 came to America and taught in an academy in Virginia, afterwards in South Carolina and in Georgia. He was for a time one of the editors of the *Southern Quarterly Review*, and in 1847 was professor of history, political economy, and international law in William and Mary college. In 1846 he was president of the university of Mississippi.

and in 1857 professor of history and literature in the university of Virginia. He prepared a series of text-books for the use of schools in the southern states, in which the sentiments and selections were made with reference to the justification of slavery.

HOLMES, JOHN, b. Mass., 1773; graduated at Brown university, and settled in Maine and practiced law. He was in the convention that formed the state constitution, four years a representative in congress, 12 years in the U. S. senate; afterwards in the state legislature, and lastly U. S. district-attorney. He died in 1843.

HOLMES, OLIVER WENDELL (*ante*). Dr. Holmes is the son of the rev. Abiel Holmes, D.D., long pastor of the First Congregational church in Cambridge and author of *American Annals*. He was born in the old "gambrel-roofed" house to which he makes frequent allusion in his works, and which is directly opposite the buildings of Harvard college, with which his relations have been intimate and almost continuous for more than fifty years. His earliest verses were written for the *Collegian*, a paper conducted by Harvard undergraduates, and many of his minor poems have been called forth by the anniversaries of the class of 1829, of which he is the most famous member, but which included Benjamin Pierce, the mathematician; justice Benjamin R. Curtis, of the supreme court; George T. Bigelow, chief-justice of Mass.; and among the living, James Freeman Clarke and William H. Channing. On leaving college he read law for a time, but subsequently devoting himself to the study of medicine, became extremely skillful both in the theory and practice of his profession. The psychological problems raised by the interdependence of mind and matter have long occupied Holmes's attention, and are scientifically discussed in his *Currents and Countercurrents in Medical Science* (1861), and in *Mechanism and Morals*. His romance *Elsie Venner* deals with the same subject from an artistic standpoint. He was one of the founders of the *Atlantic Monthly*, to whose success his productions—and in particular his best prose work, the *Autocrat of the Breakfast Table*—have largely contributed. Of his humorous verses the *One Horse Shay* and the *September Gale* are, perhaps, best known. *The Nautilus* and *Avis*, among those in a serious vein, deserve mention. Dr. Holmes is the most graceful of American writers of *vers de société*. His more labored poems are written in pentameters, but he employs successfully a variety of lyric measures. Most of his later verse has been written for special occasions. His most recent work is the *Iron Gate* (1880). Besides his contributions to medical periodicals, he has written for the *North American Review* and the *International Review*.

HOLMES, OLIVER WENDELL, JR., son of Dr. Oliver Wendell, graduated at Harvard in 1861, served in the federal army during the rebellion, read law, and is a member of the Boston bar. He has published the 12th edition of Kent's *Commentaries*, revised to conform to the present state of the law, and with full and learned annotations. Holmes has been editor of the *American Law Review*, for which he wrote a series of articles on the growth of legal conceptions.

HOLM OAK, or HOLLY OAK, the ilex of the Romans; an evergreen of s. Europe and n. Africa noted for beauty and the exceeding durability of its timber.

HOLSTON, a river and branch of the Tennessee, rising in Virginia and runnings w. through a fertile valley at the base of Cumberland mountains, joining the Clinch river in Roane county. Its extreme length is about 350 miles. Steamboats of light draught come up as far as Knoxville.

HOLT, a co. in n.w. Missouri bordering on Kansas and Nebraska, between the Missouri and Nodaway rivers; crossed by the Kansas City, St. Joseph and Council Bluffs railroad; 470 sq.m.; pop. '80, 15,510—225 colored. The surface is undulating and there are high bluffs along the Missouri river. The soil is good; chief productions: wheat, oats, corn, and butter. Co. seat, Oregon.

HOLT, a co. in n. Nebraska on the Dakotah border, s. of Niobrara river, and drained in part by the Elkhorn; 2,100 sq.m.; pop. '80, 3,287. Co. seat, O'Neill City.

HOLT, Sir JOHN, 1642–1709; b. England; lord chief-justice of the court of the king's bench in the reign of William. His father, sir Thomas Holt, had been sergeant-at-law, and his eldest son, John, followed the profession of law. After having been entered at Oriel college, Oxford, as a gentleman commoner, he became a member of Gray's inn in 1658. He soon displayed a decided predilection for the study of law, became an able advocate, and well versed in the constitutional law of England. He was made recorder of London in 1685, which office he held for a year and a half, when he became unpopular at court. It had been determined to abolish the test act; but the measure was opposed by Holt, and in consequence he had to retire from the office of recorder. Subsequently, in 1686, he was made sergeant-at-law. The ability which he displayed in the convention parliament raised him so high in the estimation of the prince of Orange, that, upon the accession of the latter to the English throne, Holt was made lord chief-justice of the king's bench. Upon the removal of Somers in 1700 from the chancellorship, William was desirous that Holt should accept the great seal, but he declined.

HOLT, JOSEPH, b. Ky., 1807; received a collegiate education, and in 1832 began the practice of law in Louisville. In 1857 he was commissioner of patents, and in 1859

postmaster general. When Floyd, secretary of war, went over to the rebellion in Dec., 1860, Holt assumed charge of the department. In 1862 he was made judge advocate general of the army.

HÖLTY, LUDWIG HEINRICH CHRISTOPH, 1748-76; b. at Mariensee, near Hanover. He studied theology at the university of Göttingen, and became a member of the society of poets formed by Bürger, Müller, and count C. Stolberg. He had a very delicate constitution, and died at the early age of 28, while preparing a collection of his poems. They were published in 1783 by his friends Stolberg and Voss, and became very popular.

HOLTZENDORFF, FRANZ VON, b. Prussia, 1829; studied law at Heidelberg and Bonn, was professor in Berlin, and in 1867 was chosen a member of the North German parliament. He has published a number of works on legal and political subjects.

HOLY COMMUNION, SISTERS OF THE, founded in New York in 1845 by ladies of the Protestant Episcopal church, mainly through the influence of rev. W. A. Muhlenberg. Their duties are the care of the sick. They take no vows, nor have they any fixed style of dress.

HOLY CROSS, CONGREGATION OF THE, founded in 1834 in France, and in 1842 in the United States, where they have many establishments, including a college at Watertown, Wis. In Europe they are called cross-bearers or croisiers.

HOLY LEAGUES, the name given to certain political alliances in Europe; the principal are as follows: 1. In 1511, between the pope, Spain, and Venice, the object being to expel the French from Italy. 2. In 1538, between Charles V. and the Roman Catholic princes of Germany in opposition to the league of Schmalkend. 3. In 1571, the pope, Spain, and Venice against the Turks. 4. In 1576, of the Guises, the pope, Spain, and the French parliament against the Huguenots. 5. In 1609, between the pope and the Roman Catholic states of Swabia and Bavaria. 6. In 1684, of Poland, Germany, and Venice against the Turks.

HOLY MAID OF KENT. See BARTON, ELIZABETH, *ante*.

HOLYOAKE, GEORGE JACOB, b. England, 1817; he was a student and teacher of mathematics in Birmingham, and while still young became noted as an advocate of extreme radicalism. He has taken great interest in the theory and practice of co-operation, and has published a *History of Co-operation in Rochdale*, where the pioneer association was established in 1844. He has for several years been the editor of *The Reasoner*, an organ of secular liberalism, or a system of civilization based upon secular and not upon theological ideas. He is a strong advocate of the utmost freedom of thought, opinion, and of action, with due regard to the rights of others. In the autumn of 1879 he visited the United States, and spoke in New York and other places on co-operation.

HOLYOKE, a city of Hampden co., Mass., on the w. bank of the Connecticut river, on the New Haven and Northampton and the Connecticut river railroads; 80 m. s.w. of Boston; pop. of town, '80, 21,851. Holyoke is a rapidly growing manufacturing city; at the South Hadley falls, the greatest water power in New England, within a mile and a half of the city, is a dam 30 ft. high and 1000 long, throwing the water into a canal 3 m. in length, which can furnish power enough to drive a million spindles. Paper is the leading article of manufacture, and there are 15 or 20 mills, employing more than 2,000 persons. About as many persons are engaged in cotton factories. The city has broad and pleasant streets, nine churches, and a fine city hall of rough split granite. One of the objects of interest is a costly monument to the soldiers who fell in the war of the rebellion.

HOLYOKE, EDWARD AUGUSTUS, LL.D., 1728-1829; b. Mass.; a physician who lived beyond the advanced age of 100 years, retaining all his faculties to the last. He graduated at Harvard college, of which his father was president, and began the practice of medicine in Salem, Mass., in 1749, and continued actively in his profession for 79 years. He was twice married, and had 12 children, of whom only two survived him. He attributed his longevity to his careful attention to the laws of health, and especially to regular sleep. At the age of 80 he had lost some teeth, was slightly deaf, and used convex glasses in reading, but as he grew older his sight strengthened, and in his 101st year he could read the smallest print without the aid of spectacles. He was present at a dinner given in honor of his 100th birthday, and responded to the congratulations of the guests in suitable words.

HOLYOKE, MOUNT, 3 m. s.e. of Northampton, Mass., is a ridge of greenstone some 1120 ft. above the sea level, very frequently visited by tourists. A carriage road winds upwards to the summit, but since the opening of the mountain railway, passengers generally prefer that method of ascent, being drawn up in small cars by a stationary engine. In 1821 a hotel was opened on the summit, from which a magnificent view is obtained. The carriage road is nearly 4 m. in length, and the ascent by rail is almost precipitous, in one instance rising 365 ft. in perpendicular height by an incline 600 ft. long. In the first 12 years after its opening 125,000 persons availed themselves of the railroad. The view from this summit has long been famous as one of the finest in New England, not for its extent or grandeur, but for a quiet loveliness due to the windings of the Connecticut river amid charming meadows and near and distant hills, while the

broad and fertile valley, highly cultured and dotted with villages, gives the scene a domestic interest. The prospect, however, has a wide range in some directions.

HOLY SPIRIT PLANT, or **DOVE PLANT**, names given to a Central American orchid, the *peristeria elata*. The flower stem is 5 or 6 ft. high, bearing upon its upper portion numerous tulip-shaped, fragrant white flowers. The stamens and pistils in the orchid family are united in a column, and in this particular plant they present the appearance of a dove with expanded wings within a spherical alabaster white vase formed by the petals. It is used in religious festivals in Central America as the symbol of the form in which the Holy Spirit descended at the baptism of our Lord.

HOMALOPSIDÆ, a family of serpents distinguished by having flat, plate-like spaces on their heads and on the abdomen. The family comprises a number of genera, five or six of which are found in North America.

HOME, DANIEL DUNGLAS, b. Scotland, 1833; especially noted as a spiritualist. When a child he came to the United States, and at 17 years of age was extensively known as a medium, and the most surprising stories were told of his powers and his manifestations. In 1833 he began the study of medicine, but soon gave it up and visited Europe. While in Rome he joined the Roman Catholic church. At St. Petersburg in 1858 he married a Russian lady of noble birth. She died in 1862, leaving a son. In 1864 Home was expelled from the city of Rome by the church authorities for his spiritualistic practices. For some years he was conspicuous in London, and in 1871 he married another Russian lady of rank. He has published a number of works on spiritualism.

HOME, Sir EVERARD, 1755-1832; was of Scotch extraction, and his connection with the Hunters brought him into notice early in life. At one time he was held in high estimation as a surgical practitioner. He was one of the surgeons to St. George's hospital; and this circumstance, added to the publication of various works which attained a considerable share of celebrity, contributed greatly to extend his reputation. In 1813 he was created a baronet, and was also appointed sergeant-surgeon to the king. He was the author of *Practical Observations on Stricture*; *Lectures on Comparative Anatomy*; and of various papers in the *Philosophical Transactions*.

HOMEOPATHY (*ante*) was introduced into the United States in 1825 by HANS B. GRAM, a native of Boston, educated in Denmark. Eminent physicians of the old school, after careful study and observation, gave it their adherence. It was adopted in other places, and the practice has grown steadily to the present time, when there are in the country probably not less than 7,000 physicians of this school; 10 or 12 homeopathic colleges, graduating annually from 200 to 300 students; 40 homeopathic dispensaries; more than 30 homeopathic hospitals; and 15 periodicals devoted to the system. Its literature embraces works by men eminent for learning and ability. While homeopathic physicians agree in accepting the fundamental teachings of the system, there is considerable diversity of practice among them in regard to detail, especially as to the use of high attenuations.

HOMER, a t. and village in Cortland co., N. Y., on the Syracuse and Binghamton railroad, 27 m. s. of Syracuse; pop. of t., 3,657. In the village are several churches and a number of manufactories.

HOME RULE FOR IRELAND. How to rule Ireland peaceably and well has been a problem ever since its annexation. Irish agitations have passed into a by-word, and as many schemes have been propounded for the amelioration of the condition of the country as would number the years of British rule. The Fenian outbreak (1864) led to so much suffering for all classes, and entailed such misery upon many utterly innocent of its principles, that the attention of the ablest men in the distracted country was directed to some project which, while leaving Ireland substantially under the British rule, should secure for it free legislation in matters of internal interest. Hence arose the home-rule league, first suggested by the able and far-seeing Isaac Butt, member for Dublin, and for many years controlled by him and largely influenced by John Francis Maguire, M.P. for Cork. Its professed object was to declare the right of the Irish people to self-government, and to establish the principles of a federal arrangement, by which the right of legislating for and regulating all matters relating to the internal affairs of the country should be secured to an Irish parliament, consisting of an equal number of Protestants and Roman Catholics, leaving to the imperial parliament all questions affecting the imperial crown in its relation to other countries, and, in short, all and everything pertaining to the defense and protection of the empire at large. Mr. Butt advocated a government for Ireland as a constituency of Great Britain, such as obtains in the United States, where each individual state is self-governed and yet represented in the national congress. In 1871 Isaac Butt was returned as member for Limerick, and two years later the first convention of the home-rule league was held in Dublin. At the succeeding election (1874) its popularity was demonstrated, 60 members from Ireland being returned upon its merits, and 28 in England solemnly engaging to support it; nevertheless a motion in the houses in its favor was defeated by 314 to 52, and, in the following year, Mr. Butt's motion for a committee on the subject was negatived three several times. A stormy convention was held at Dublin in 1877, which was followed by increased activity on the part of the home-rule members in the houses, Mr. Butt still

being the chosen leader of the party. In 1878 he resigned, and the principles of the home-rule party having undergone a change, it has lately become apparent that their ultimate object is the establishment of an Irish parliament in which four-fifths of the members will be Roman Catholics.

HOMESTEAD LAWS, laws enacted by a majority of the states composing the American union, exempting a homestead of greater or less value from attachment for debt, and reserving the same for the benefit of the owner's family. The laws of the several states making such a provision are exceedingly various both as to the value of the estate reserved, the circumstances and conditions under which the exemption takes place, and the ways in which it is brought to a termination. The value of an exempted homestead in some states is limited to \$300, in others to \$500, in others to \$1000, in others to \$1500, in others to \$2,000, in others to \$3,000, and in others still to \$5,000. The homestead laws have been enacted within the last fifty years, in order to remove the hardships of the common law as respects wives and children. They impose a limitation on the power of a husband and father to distress his family by alienating the estate which he may have received in whole or in part from his wife, or of which he has become possessed in part by her labors and sacrifices. It is held to be sound public policy to guard the homes of the people from seizure and sale at the pleasure of creditors, as well as from a too easy alienation by husbands and fathers. The practical effect of these laws has served to commend them to general favor, and they are likely to be permanent. It is not improbable that they may even undergo some modifications with a view to the more effectual protection of the rights and interests of women and children.

HOMICIDE (*ante*), the killing of one human being by another either innocently or feloniously. To say that there has been a homicide does not necessarily imply that a crime has been committed; for, though every murder is a homicide, every homicide is not a murder. The law permits a man to kill another in self-defense when his own life is assailed or threatened; but the danger must be real, or in good faith and for sound reasons deemed so by the person threatened. A man may lawfully kill another, after due warning, in defense of his property, or to prevent the escape of one who has committed a felony. An officer of justice charged with the duty of arresting a criminal or with the performance of any other lawful act may kill a person who resists or attempts to thwart him by force. A person charged with felony, seeking to escape after arrest or fleeing to avoid capture, may be lawfully killed by an officer if he cannot otherwise be taken. A man engaged in committing a felony may be lawfully killed by an eye-witness if there be no other way of preventing the crime. The keeper of a prison may, if necessary, prevent the escape of a prisoner by taking his life. In all such cases, however, it must appear that the killing was resorted to as a last alternative. Justifiable homicide is the term applied in law to all such cases. Where one kills another by accident, without any intention to do him injury, and while exercising a proper degree of caution, the law deems it an excusable homicide; as, for example, when a man driving in the highway in the darkness runs over and kills another without knowing it, or, discovering the danger, has yet no time or power to avert the calamity. The line between justifiable and excusable homicide is vague and, in a legal sense, not important, since neither the one nor the other exposes a man to punishment. In some of the states of the union no distinction is made between them. See **MURDER**, *ante*.

HOMINIDÆ (from *homo*, and meaning "man family"). Some naturalists place man in the same order with the **QUADRUMANA**, classifying him in the subordinate position of a family. To this family they have given the name *hominidæ*, of the order **PRIMATES**, which includes the apes and monkeys. Certain structural affinities are offered as grounds for this classification, but many naturalists reject the reasons, and maintain, with prof. Owen, that "man is the sole species of his genus, the sole representative of his order." The generally adopted classification is that which includes man with the type or branch of **VERTEBRATES** and class **MAMMALIA**. So far, it is allowed, the analogy holds good between man and certain lower orders of animals; but when we come to divide the great class of mammals into orders, it is held that there are certain distinguishing characteristics which separate man from all the rest. The nearest approach to him is in the apes, but these animals are all four-handed, and it is contended that they have nothing which can be regarded as at all parallel with the foot of the perfectly erect-standing man, and that their whole organization is totally unfitted for that posture. Naturalists have, therefore, usually given man an order by himself, the order **BIMANA**, and in this he has been grouped into different races and varieties; but any division into genera, under this order, is of course inadmissible. See **BIMANA** and **MAN**, *ante*.

HOMOCERCAL. See **HETEROCERCAL**, *ante*.

HOMOLOGY, in chemistry, is used to express agreement of composition or structure in organic bodies. See **BOILING OF LIQUIDS**: under which title the tables—given to show the differences of boiling points corresponding to differences in the chemical structure of certain liquids—are tables of homologous alcohols and acids. The members of the homologous series differ by the addition or subtraction of certain organic radicals.

HOMŒOPATHY. See **HOMŒOPATHY**.

HOMPESCH, FERDINAND VON, 1744-1803; b. Germany, of a noble Prussian family. At 13 years of age he went to Malta in the capacity of page to Rohan, grand-master of the knights of St. John, and rapidly rose to position in the order, and became the last grand-master. The seizure of Malta by Bonaparte in 1798 induced Hompesch to resign his mastership to the czar of Russia, who granted him a pension. He died in France in very poor circumstances.

HOMS, or HUMS. See HEMS, *ante*.

HONDEKOETER, MELCHIOR, 1636-95; a Dutch animal-painter. His father and grandfather had both made a considerable name in that walk of art, but their fame was soon eclipsed by his. Though he painted every kind of animal, his favorite subjects were cocks, hens, ducks, and peacocks, which he delineated with wonderful correctness and truth. It is said that he trained a cock to stand in whatever attitude he desired, and to remain in that position for several hours at a time without moving a muscle. The landscapes which he introduced as backgrounds to his pictures were equally true to nature, and finished with a delicate lightness and transparency of touch that harmonized admirably with the subject of the piece. In his special line he is still unrivaled, and his pictures, of which the best are in English collections, command high prices.

HONDO. From *hon*, main, chief, and *do*, continent or island, the name of the chief island of the empire of Japan; often, but incorrectly, called Nippon or Nihon. Nippon is not the name of any one island, but of the entire Japanese empire. In ancient times the Japanese had no need to give a special designation to their largest island, since they divided their country not into islands, but into *do* or circuits, in which insular boundaries were ignored (see JAPAN); just as we say "middle states," "western states," etc. Of late years the Japanese, studying geography in the western fashion, and seeing the necessity of a name for their chief island, have called it Hondo. (See the excellent geography issued by the Japanese war department, 1874, with accompanying copper-plate map of Japan.) The application of the erroneous name Nippon (incorrectly spelled Nipon or Niphon) to the chief island originated with Kampfer, the Jesuits who wrote previously to him knowing Japanese geography too well to use the misleading term. Hondo contains an area officially computed in 1874, at 87,425 sq.m., with a population, by census of 1874, of 25,166,531. It comprises the circuits of Tokaido, Kinai, Tozando, Hokurikudo, Sanindo, Sanyodo, and one province of Nankaido. Its shape is a crescent, with horns toward Asia. A remarkable difference in climate is noted between the eastern and the western halves of Hondo, the former under the influence of the Kuro Shiwo, or gulf stream of the Pacific, being mild and warm; the latter, receiving the cold winds and under the influence of cold currents, having a severer climate. The promontories of Hondo are now dotted with well-equipped lighthouses.

HONDURAS (*ante*). The coast was discovered by Columbus in 1502, and in 1526 the country was invaded and possessed by Cortes, at the head of an army of Europeans and Indians which he brought with him from Mexico. He founded the towns of Trujillo and Puerto Caballos (now Puerto Cortes). Central America soon afterwards fell under the dominion of Spain, Gracias being the seat of government. In 1822 Honduras became a part of the Central American confederation, but asserted its independence in 1839, and for more than twenty years was involved in civil strifes which hindered the development of the country. In 1861 there were attempts at insurrection, instigated by the clergy. These attempts were defeated by president Guardiola, who pardoned all the conspirators and was afterwards assassinated. His successor, Montes, entered into an alliance with San Salvador against Guatemala and Nicaragua, but was defeated in battle, when Medina, one of his own generals, joined the victors and usurped the presidency in 1863. He in turn was deposed in 1872 by Don Celeo Arias, who held the place until Aug., 1875, when Dr. Marco Aurelio Soto was appointed provisional president; and in May of the following year the latter was elected by the unanimous voice of the people as constitutional president for the term of four years. The internecine strifes, and the wars with neighboring republics which preceded his accession to power, had a most disastrous effect upon the country. Industry was prostrated, the schools forsaken, an onerous foreign debt incurred, and the minds of citizens filled with doubt and apprehension. Since 1876 public confidence has been restored, industry revived, intercourse with other countries extended, highways constructed, bridges erected, and new plans adopted for general education. The public revenue, which under former administrations rarely exceeded \$300,000, is now estimated at \$800,000 per annum. The population of the country is estimated at 400,000. Tegucigalpa, the capital, has 12,000 inhabitants. The executive power is vested in a president elected for four years, and assisted by a council of state, composed of two ministers appointed by himself, a senator elected by congress, and a judge of the supreme court. The legislature consists of a senate and a chamber of deputies. The judicial power is vested in two chief-justices, one of whom resides at the present, the other at the former capital, and in a district judge for each department. These judges are appointed for life by the government; but the justices of the peace, one for each town, are elected for one year by the municipalities. There is a standing army of 1500 men, and a militia of

20,000. Some years since, a combination of American capitalists was formed to establish a banking, exchange, and commission business at the capital, in order to facilitate commerce between the two countries. A railway from Puerto Cortes, on the Atlantic coast, to San Pedro Sula, a distance of about 90 m., has been constructed. It cost \$2,000,000, and it has rolling-stock valued at \$500,000. More than 1000 m. of telegraph are in operation in the republic. It was reported not long ago that Honduras and San Salvador were making an arrangement to put all the Central American states into telegraphic communication with each other. There are no official returns of foreign commerce. An extensive fruit-trade is carried on between the Atlantic ports of Honduras and New Orleans, which might be vastly increased by employing steamers instead of sailing-vessels. Fruits are abundant and of exquisite quality in the northern coast-region and adjacent islands. Large numbers of cattle are annually exported to Cuba. Mahogany, tobacco, hides, sarsaparilla, indigo, and other dye-stuffs, are also among the exports. Coarse woolen stuffs and rude utensils for home use are the only articles of manufacture. Bees are numerous and yield large quantities of honey. Fish in great variety inhabit the rivers and lakes and abound on the coasts. Tarantulas, scorpions, and venomous insects of various kinds infest every part of the country. Alligators and lizards are numerous. The rattlesnake and coral are the only venomous serpents. Locusts are often very destructive. The predatory birds are the hawk, the vulture, and the turkey-buzzard. Aquatic birds are numerous. The face of the country is mountainous, the highest elevations being 8,000 ft. above the sea. The rivers are numerous, most of them flowing to the Atlantic. The largest of these rivers is the Ulu, which is navigable for 70 m. for steamers of small draft. The Segovia, which forms a portion of the southern boundary, receives its principal waters from Honduras, and has a course of 350 m. through an unbroken wilderness, over a rocky bed, and is broken by rapids which make navigation impracticable. The soil is extremely fertile, and vegetation is luxuriant. The sugar-cane is indigenous, thriving well at elevations of 4,000 ft. above the sea. Coffee flourishes, and tobacco of the best quality is raised. Pimento, capsicum, and other spices are plentiful. Mahogany and rosewood are found in great abundance, as are also many other valuable cabinet woods. The climate is equable on the highlands, but hot on the Caribbean coast, where miasmatic fevers are common. Mining, once the chief business of the country, is now almost abandoned, on account of the great difficulties in the way of transportation. Silver and gold are abundant, but the mines cannot at present be profitably worked. The wars which ravaged the country for so long a time repelled both immigration and capital. So long as the precious metals can be obtained in great abundance in regions where peace and good government prevail, and where railroads afford the best facilities for transportation, men are not likely to seek them in countries torn by civil war, and where the mule is the only carrying agent. In 1878 the government founded a national college and seminary, both of which are under the direction of American teachers. Schools are to be found in every town and village, and in 1878, 25,000 children were attending them. The religion of the country is Roman Catholic, under the jurisdiction of the bishop of Comayagua. Of the 400,000 inhabitants, 205,000 are mestizos, 184,000 Indians, 5,750 whites (descendants of the early Spanish settlers), and 5,250 negroes.

HONEY ANT, a name given to several species of the ant family, inhabiting Mexico, New Mexico, and Arizona. Like other ants they live in colonies, and most of them have considerable resemblance to our common brown ant. Some of them secrete honey in their abdominal cavities, and become very much swollen, so that they cannot travel. They are then placed in rows in galleries and fed and waited on by the other ants. They become at last apparently spherical distended sacs, the head and thorax having the appearance of a small stem. When food becomes scarce these "stall-fed" ants are eaten by the less-pampered members of the community.

HONG, the Chinese name for a factory or warehouse kept by foreigners. The word signifies a row or series of shops or rooms. In Canton each block so occupied is known as a "hong," and when about a dozen great traders had the monopoly of the foreign trade they were called "hong merchants."

HONG-KIANG, or **WESTERN RIVER**. See **SI-KIANG**, *ante*.

HONORARIUM (*ante*). It would be, perhaps, more precise to say that the *honorarium* was not given as a present, but strictly as a mark of honor, and the amount was not left at the will of the payer, but was rather settled by custom, varying of course with the standing of the employed. According to Brande the *honorarium* was originally applied solely to the salaries of the great officers of state, by way of intimation that they were tendered as a mark of honor.

HONORIA, **JUSTA GRATA**, a daughter of Constantius III., and sister to Valentinian III., b. 418 A.D. in Constantinople; lived at Valentinian's court in Rome. She secretly invited Attila the Hun to marry her, but as he did not entertain the proposition, she sent another invitation, and Attila accepting it, claimed with her a portion of the empire. As Valentinian refused to accede to such a demand, Attila invaded Gaul. Honoria's fate is unknown.

HONT, a co. in n.w. Hungary, on the Danube; 986 sq.m.; pop. '70, 123,800. The surface is mountainous, and the soil generally fertile, producing grain, hemp, flax, and tobacco. Schemnitz is the most important town.

HOOD, a co. in n. Texas on the Brazos river; 614 sq.m.; pop. '70, 2,585—97 colored. The surface is rough, with some prairie and much forest land. The soil is rich and productive. Comanche peak is one of the physical features; it rises 600 ft. above the Brazos. Co. seat, Granbury.

HOOD, JOHN BELL, b. Ky., 1831; graduated at West Point, and was on frontier duty until the beginning of the rebellion. He then joined the rebels, and was one of their most active officers, attaining the rank of lieut.gen. He was engaged at Bull Run, Antietam, Gettysburg, and at Chickamauga (where he lost a leg). In 1864 he received the command of Johnston's army in the attempt to intercept Sherman's march to the sea, but in Nov. and Dec. he suffered serious defeats from the union forces under Thomas before Nashville. He was immediately relieved from command and retired to private life. He died in 1879.

HOODED SEAL, *Stenmatopus cristatus*, Cuv.; *phoca cristata*, Gmel.; *phoca leonina*, Fabr., an animal inhabiting the coasts of Greenland, and North America as far s. as the United States. They are generally found in the ice islands and floating ice-floes in the open sea, visiting the land in April, May, and June. About 2 in. from the extremity of the upper jaw there is a cartilaginous crest, increasing in height as it passes backwards to the back part of the head, where it is about 7 in. high, having a longitudinal depression in the middle, about an inch deep. This crest is an elongation of the septum of the nose, the true nostrils opening on either side of it. It terminates in a muscular hood covered with fur. The whole apparatus is probably accessory to the organ of smell, and, as the fishermen suppose, serves as a reservoir of air while the animal is under water. The females and young have the organ in a rudimentary state. The hooded seal is polygamous and brings forth its young on the ice. It is quite fierce, and will defend itself when encountered, and the animals often have fierce battles with each other. It has a voice resembling the bark and whine of a dog, and when attacked weeps copious tears. It and the rough seal furnish most of the skins sent to market.

HOOGLY, an extensive district in the province of Bengal, formerly called Saategong, between lat. 22° and 23° n., and extending a considerable distance along the right bank of the river Hoogly. It is bounded on the n. by the district of Burdwan, on the s. by Hidjeelee, on the e. by the Hoogly, and on the w. by Midnapoor. This district consists of low, flat land, very fertile, but that part which is nearest to the sea is very thinly inhabited; it is called the Sunderbund, is swampy, covered with wood, and remarkably unhealthy. It is intersected in every direction by rivers and their branches, which afford great facilities for internal navigation. Along the shores of the ocean salt of an excellent quality is manufactured for the government. The area is 2,089 sq. miles. The pop. is given at 1,520,840, an amount which, compared with the area, indicates the extraordinary density of 728 to the sq. mile. The French settlement of Chandernagore is situated within the limits of the district, as are also Chinsura, and Serampore, now British possessions, but formerly belonging, the first to the Dutch, and the latter to the Danes. The right of the East India company to the district originated in the treaty concluded with Meer Cossin in 1760.

HOOKE, NATHANIEL, d. 1763; a native of Ireland; author of a *History of Rome*, embracing the period extending from the foundation of the city to the time of Augustus. It was published in 4 vols. at intervals of 40 years between the appearance of the first and the last. His work possesses the virtues of acuteness and clearness. In opposition to Middleton, he defended the cause of the plebeians against the patricians. Hooke was a zealous Roman Catholic. When Pope was dying, a priest was brought to hear his confession and grant him absolution. This priest was brought by Hooke. He had been employed and well paid by the duchess of Marlborough for assisting her in writing her memoirs, but he was so zealous in attempting to convert the duchess to Catholicism that a quarrel was the consequence. He was one of the sufferers from the South Sea bubble. Besides his *Roman History*, he wrote *Observations upon the Roman Senate*, in which he advanced and extended the political views propounded in his *History*. He also translated from the French the life of Fénelon, and Ramsay's *Voyages de Cyrus*.

HOOKE, JOSEPH, 1815-79; b. Mass.; graduated at West Point in 1837, and served in the Florida and Mexican wars. At the battle of Monterey, he made himself conspicuous for gallantry, securing the brevet of capt., and when gen. Scott assumed command, Hooker was made assistant adjt.gen. He went through the campaign, from Vera Cruz to the city of Mexico. During the struggle at National Bridge, he so distinguished himself as to gain the brevet of major, and his services at Chapultepec obtained for him another brevet, that of lieut.col. In 1853 he resigned from the army and commenced farming in California. When tidings of the firing on Sumter reached him, he hurried to Washington and offered his services to the government. He was at once commissioned brig.gen. of volunteers, commanding a brigade in the department of Annapolis, ^{22d} subsequently a division. He led several expeditions across the Potomac in the

winter of 1861-62, capturing or destroying rebel batteries. In April, 1862, he took command of the 2d division of the 3d corps on the peninsula, and distinguished himself in the siege of Yorktown, May 4; the battle of Williamsburg, May 5, and the succeeding pursuit; Fair Oaks, May 31 and June 1; and during the "seven days' battle," especially at Malvern hill, and became known as "fighting Joe Hooker." He was made maj.gen. for gallantry, his commission dating July 4, 1862, but afterwards dated back by the president to May 5. He also took a prominent part at Bristoe station, the second Bull Run, Chantilly, and South mountain, and at Antietam was wounded. Sept. 20 he was commissioned brig.gen. in the regular army. He commanded a grand division under Burnside in the battle of Fredericksburg, and succeeded him in command of the army of the Potomac, Jan. 26, 1863. In May he fought the battle of Chancellorsville, and June 27 resigned his command, being succeeded by gen. Meade.

In Sept. following he took command of the 12th and 13th army corps near Chattanooga, and took part in the battles in that vicinity in Nov., and commanded in the battle of Lookout mountain, for which he was made brevet maj.gen. Later he commanded the 20th corps, known as the army of the Cumberland, near Atlanta, but resigned this command in Aug., 1864. In Sept., 1864, he took command of the northern department, of the department of the east in 1865, and in 1866 of that of the lakes; and in Sept., 1866, was mustered out of the volunteer service. In 1878 he was made brevet maj.gen. of the regular army, and retired from service. His health was greatly impaired, a paralytic affection disabling him in great degree. He resided much of his time at the hotel in Garden City, L. I., and died there in Mar., 1879.

HOOKER, THOMAS, 1586-1647; b. England; graduated at Cambridge, and was a preacher in London. He was silenced for non-conformity, and then set up a grammar school in which John Eliot, afterwards known in New England as the "apostle of the Indians," was usher. After preaching in Holland he came, in 1633, to America, and was ordained at Cambridge. Three years afterwards he went with about 100 other colonists to Connecticut, where they settled at Hartford, as it was afterwards called, where he and Samuel Stone were the first ministers. He preached usually without notes, but about 200 of his sermons were reported and sent to England, where half of them were published. His most important literary work was *A Survey of the Sum of Church Discipline*, written in conjunction with John Cotton, and published in England.

HOOKER, WORTHINGTON, 1806-67; graduated in medicine at Harvard, and practiced in Connecticut until 1852, when he became professor of the theory and practice of medicine in Yale college, and remained there through life. His principal works are *Physician and Patient*, and *Lessons from the History of Modern Delusions*.

HOOPER, WILLIAM, 1742-90; b. Boston; graduated at Harvard and studied law in the office of James Otis; removed to North Carolina and practiced with great success. He was a political leader there, a member of the continental congress, and one of the signers of the declaration of independence.

HOOSAC TUNNEL. See TUNNEL.

HOPE, Sir JAMES, b. Scotland, 1808; entered the British naval service in 1822, and in 1838 was appointed captain. He was in the river Platte expedition in 1844, and during the Crimean war in the Baltic fleet. In 1859 he was in chief command on the Chinese coast, and was knighted for valuable services. In 1870 he became admiral, and in 1878 was placed on the retired list.

HOPE, THOMAS CHARLES, 1766-1844; for more than half a century professor of chemistry in Glasgow and Edinburgh universities. He discovered a new earth, which he named strontites, in a mineral found in the strontian lead-mines in Argyleshire. He made many important investigations. Some of his papers are *On the Point of the Greatest Density of Water*; *Observations and Experiments on the Colored and Colorable Matters in the Leaves and Flowers of Plants*; and *On the Chemical Nomenclature of Inorganic Compounds*.

HOPE AND COMPANY, a famous banking-house of Amsterdam, started, about the close of the 17th c., by Henry Hope, a Scotchman. The head of the firm at the time of its greatest prosperity was another Henry Hope (1736-1811), b. Boston, Mass., the son of a Scotch royalist. Thomas Hope, the author of *Anastasis*, was also a partner. Another partner, and a remarkable financier, was Peter C. Labouchere, whose marriage with a daughter of sir Francis Baring brought the two great banking-houses into intimate business relations. The Hope house has had heavy transactions with European governments, particularly with Holland and Russia. On one occasion the latter government owed the house \$25,000,000. The present head of the firm is Adrian Elias Hope, b. 1845.

HOPKINS, a co. in w. Kentucky, on Pond and Tradewater rivers, intersected by the St. Louis and Southwestern and the Paducah and Elizabethtown railroads; 400 sq.m.; pop. '80, 19,123—2,710 colored. The surface is uneven and well wooded; soil fertile. Productions: tobacco, corn, pork, etc. Co. seat, Madisonville.

HOPKINS, a co. in n.e. Texas, drained by a branch of the Red river; 750 sq.m.; pop. '70, 12,651—1620 colored. The surface is prairie and woodland. Chief productions: corn, cotton, butter, and wool. Co. seat, Sulphur Springs

HOPKINS, EDWARD, 1600-57; b. England; a London trader who came to New England in 1637 and settled at Hartford, where he was a magistrate, and governor of the colony every alternate year from 1640 to 1654. Later in life he returned to London, where he died. He left £1000 to support grammar-schools in Hartford and New Haven, and £500 to Harvard college and a school at Cambridge.

HOPKINS, ESEK, 1718-1802; b. R. I.; commissioned as a brig.gen. in the revolutionary army, and in 1775 made a commodore and commander-in-chief of the new American navy. He went to sea in Feb., 1776, with four ships and three sloops, and took the forts at New Providence, with all the guns, ammunition, and stores. On his return he seized an English schooner and a bomb-brig. His later operations were less fortunate, and in Jan., 1777, he was dismissed from service for negligence. He was several times chosen to the Rhode Island general assembly.

HOPKINS, EZEKIEL, 1633-90; bishop of Londonderry; b. England. His early education was conducted under Presbyterian and independent influences—a fact which threatened at first to mar his prospects of church preferment. Upon leaving Oxford, where he had been chaplain of Magdalen college, he was presented to the living of St. Mary Woolnoth, in London. When the great plague broke out in the capital, Hopkins withdrew to Exeter, where he obtained the living of St. Mary's. Here he married Araminta, a daughter of lord Robartes; and when that nobleman was made lord-lieutenant of Ireland, Hopkins went with him to Dublin, and through his influence obtained the deanery of Raphoe. In 1681 he was made bishop of Londonderry. In the famous siege of that town by the Irish adherents of James II., in 1689, Hopkins showed how completely he had outlived the influences of his early training by preaching with the most earnest zeal the doctrines of non-resistance. In the course of the siege he withdrew from the town, and retired first to Raphoe and afterwards to London, where he was made rector of St. Mary Aldermanbury. This charge he held until his death in June, 1690. His works, which have been frequently republished, comprise *Sermons*, *Expositions of the Decalogue* and the *Lord's Prayer*, and elaborate discourses on *Regeneration* and *The Vanity of the World*.

HOPKINS, JOHN HENRY, D.C.L., LL.D., 1792-1868; b. Ireland; came to the United States when a child, and received a classical education, and became an iron manufacturer in Pennsylvania. Not succeeding in business, he studied law, and began practice in Pittsburgh, but in 1823 he entered the ministry of the Protestant Episcopal church; in 1826, and again three years later, he was a delegate to a general convention, where he took a prominent part. In 1831 he accepted the charge of Trinity church, Boston, and the next year was chosen bishop of Vermont, taking also the rectorship of a church in Burlington. He took great interest in education, and made heavy pecuniary sacrifices for its promotion. After 1856 he devoted his whole time to the supervision of the diocese. Bishop Hopkins was a prolific writer, leaving nearly 20 published works, among which are *Christianity Vindicated*; *The Primitive Creed Examined and Explained*; *The Novelties which Disturb our Peace*; *History of the Confessional*; *The American Citizen, his Rights and Duties*; *A Scriptural, Ecclesiastical, and Historical View of Slavery*, etc. He was prominent in the Pan-Anglican synod in London in 1867.

HOPKINS, JOHNS, 1795-1873; b. Maryland; a member of the society of Friends; made a large fortune in trade; became a bank president and railroad director in Baltimore. He was never married. In 1873 he founded the Hopkins free hospital, an orphanage for colored children, and the splendid Johns Hopkins university, at an aggregate cost of more than \$8,000,000. (See BALTIMORE.)

HOPKINS, LEMUEL, 1750-1801; b. Conn. He was a physician in Litchfield and in Hartford. He wrote satirical and political verses, such as *The Guillotine*, *The Political Greenhouse*, *The Hypocrite's Hope*, and *The Victim of a Cancer Quack*. He was one of "the Hartford wits" who wrote the *Anarchid* in advocacy of a strong federal constitution.

HOPKINS, MARK, D.D., LL.D.; b. Stockbridge, Mass., Feb. 4; 1802. He graduated at Williams college in 1824, was tutor there for two years, studied medicine, and after receiving his degree of M.D. began practice in New York. In 1830 he returned to the college as professor of moral philosophy and rhetoric, and held this chair till 1836, when he became president. The duties of this office he discharged for 36 years, holding also the professorship of mental and moral philosophy. In 1872 he resigned the presidency, according to a purpose long declared to retire at the age of 70 years; but he still retains the professorship of mental and moral philosophy. He received the degree of D.D. from Dartmouth college in 1837, and of LL.D. from the university of New York in 1857. In the latter year he became president of the American board of foreign missions. As a teacher of mental and moral philosophy he has impressed himself upon his classes, and given a high reputation to the college. In connection with his work he has published *Lectures on Moral Science*; *The Law of Love, and Love as a Law*; and *An Outline Study of Man*. As early as 1845 he delivered a course of lectures, on the Lowell foundation in Boston, on the Evidences of Christianity, which were published, and are ranked with the most important works of their class, and are used as a text-book in Williams and many other colleges. He has for many years conducted with the senior college

class a weekly recitation in the Westminster catechism, which he makes a lecture and discussion with the students of the main truths of natural and revealed religion. He has long been pastor of the college church, and in his personal intercourse with the students has maintained a strong control together with genial relations of friendship. His administration of the college was remarkably successful, and he has been called by prof. A. P. Peabody, of Harvard university, "the first of living educators." He has been eminent as a preacher and lecturer. His baccalaureate and other occasional discourses have been published, and many of them gathered in book form.

HOPKINS, STEPHEN, LL.D., 1707-85; b. R. I.; a member of the colonial assembly in 1733, and in 1739 chief-justice of common pleas. In 1755 he was governor; in 1754, one of the commissioners to devise a plan for the union of the colonies. He took an early and active part in the movements for independence, and in 1774 was one of the colony's representatives in congress, where he served three terms. His signature to the declaration of independence is remarkable for its tremulous character, which is said to have been the consequence of a nervous affection. In 1765 he commenced a *History of the Planting and Growth of Providence*. Another work, published in London, was *The Rights of the Colonies Examined*.

HOPKINSON, FRANCIS, 1737-91; b. Philadelphia; graduated at the college of that city, of which he was the earliest pupil. He studied law, and after a brief visit to England took up his residence in Bordentown, N. J. In 1776 he was sent as a delegate to the continental congress. He wrote many sharp satires and popular poems, which did good work for the cause of liberty. In 1779 he was appointed judge of admiralty. On the organization of the federal government he was appointed district judge for Pennsylvania. Among his numerous satires the best remembered is *The Battle of the Kegs*. He was one of the signers of the declaration of independence.

HOPKINSON, JOSEPH, LL.D., 1770-1842; son of Francis; graduated at the university of Pennsylvania, and became celebrated as a lawyer. On the impeachment of judge Chase, Hopkinson was chosen for the defense, and his client was readily acquitted. Hopkinson was in congress in 1815-19 and in 1828 judge of the U. S. court. He is best known as the author of the words of *Hail Columbia* (which he wrote for the benefit of a player at a Philadelphia theater), and which were set to music known as *The President's March* and composed by a German.

HOPKINSVILLE, a city in Christian co., Ky., on the St. Louis and South-eastern railroad, 71 m. n.w. of Nashville; pop., 3,126. Among the public edifices are the courthouse, seven churches, a state insane asylum, and a number of academies. There are also a number of manufactories in the city.

HOPLOPHORIDÆ. See GLYPTODON.

HOPPER, ISAAC TATEM, b. N. J., 1771; d. N. Y., 1852. His ancestors were of the religious society of Friends, but his grandfather was disowned for choosing a wife from another sect, and so he was not himself a "birthright member," but joined the society when he was 22 years of age. He was distinguished as a boy for his conscientiousness and courage, his fondness for animals, and an indomitable love of fun, which often betrayed itself in practical jokes of a very annoying character, and which in pleasanter ways he manifested even in his mature years. He was but 9 years old when he met an old negro who had been stolen from Africa when a little boy and sold into slavery. He listened to the old man's story with strong emotion, and, young as he was, made a solemn vow to himself that he would always be the friend of oppressed Africans. At 16 years of age he was apprenticed to an uncle in Philadelphia to learn the trade of a tailor. This was the golden age of Quakerism, and he fell under the influence of its most distinguished preachers and members. Even while he was an apprentice he began to be the helper of "slaves unlawfully held in bondage," of whom there were great numbers in Philadelphia. In early manhood he became an active and leading member of the abolition society founded by Franklin, Rush, and others, and in process of time was generally recognized in Philadelphia as the friend and legal adviser of colored people in all their troubles. He was also an overseer of a school for colored children, founded by the celebrated Anthony Benezet, secretary of a society for the employment of the poor, inspector of a prison, guardian of abused apprentices, and a friend of the insane. In these various forms of philanthropic labor he exhibited such courage, tact, and devotion that he won the confidence of all his associates. In the division of the society of Friends, which occurred in 1827-28, he acted with those who were called "Hicksites," influenced much, no doubt, by his great regard and admiration for Elias Hicks as an earnest anti-slavery preacher; and in 1829 he came to New York and opened a Friends' bookstore. In 1830 business called him to Ireland, and he went with letters of commendation from many of the most eminent citizens of Philadelphia. Matthew Carey wrote to him in terms which he well knew would be the surest passport to popular favor on the other side of the Atlantic. "I have been well acquainted with you," he said, "about 35 years, and I can testify that, during the whole of that time, you have been a perfect pest to our southern neighbors. A southern gentleman could scarcely visit this city without having his slave taken from him by your instrumentality; so that they dread you as they do the devil." His personal resemblance to Napoleon.

Bonaparte was so striking that it attracted general notice. Joseph Bonaparte, who knew him well, expressed the opinion that if he were to appear in Paris, dressed in the emperor's uniform, nothing could be easier than for him to excite a revolution. Mr. Hopper, naturally enough, was among the first to join the anti-slavery movement organized by Garrison in 1831. His life was often imperiled in his efforts in aid of fugitive slaves; and as for reputation, such was the state of public sentiment in New York from 1831 to 1845 that he was often denounced in public as well as private. Even the society of Friends shrank from defending him. More than once he was called upon to defend himself in the courts, but every attempt to bring him under the grasp of the law failed. In such cases he refused to employ counsel, relying confidently upon his own knowledge of the law and his ability to defend himself. Once, when he was accused, the court, impressed by the gravity of the case, earnestly advised him to engage a lawyer. "Does the court," he asked, "understand the law?" "Yes," replied the judge. "Well, then," said the imperturbable Quaker, "what need have I of counsel? The court understands the law and I understand the facts; is not that enough?" His accusers never dared to bring the case to trial. He visited the court many times, demanding to be tried, and at length the case was dismissed. Bowie-knives and pistols were more than once used by slave-hunters to frighten him, but in vain. During the pro-slavery riots of 1834 a friend advised him to remove the anti-slavery pictures from the window of his store. "Dost thou think," he replied, "I am such a coward as to forsake my principles or conceal them at the bidding of a mob?" When the mob came down the street with discordant yells, he walked out and stood upon the steps. As they stopped before his door, he looked at them with a courage and dignity so impressive that they were utterly abashed. Once he was knocked down in the street and savagely beaten by a slave-hunter's agent, who approached him from behind; but this did not in the least abate his zeal. In 1840 he was appointed treasurer and office agent of the American anti-slavery society. The society of Friends was then under the control of a party opposed to any active hostility to slavery. This party, offended by the criticisms of the *National Anti-Slavery Standard*, for which Mr. Hopper was in no way responsible, arraigned and disowned him for "being concerned in the publication and support of a paper calculated to excite discord and disunity among Friends;" in other but less ambiguous terms, for being an abolitionist. In 1845 the society removed its headquarters to Boston, which necessitated the retirement of Mr. Hopper from a post which he had filled for five years. He was now almost 70 years old, but full of bodily and mental vigor, and he gave the last years of his life mainly to the service of the New York prison association, in the organization of which he took an influential part. It was mainly through his personal influence indeed that the act of incorporation was secured. For ten years he was the active agent of this society, often visiting the prison at Sing Sing and addressing the prisoners in a way calculated to inspire in them a purpose to lead better lives. He was the friend and counselor of discharged convicts, finding employment for such as manifested a purpose to reform, and trying to keep them out of temptations which they had not the strength to resist. In this field of benevolence his ripe judgment, rare tact, and true sympathy for the unfortunate found ample exercise. The institution for discharged female convicts was named, in his honor, "The Isaac T. Hopper Home," and has been administered from that day to the present by his daughter, Mrs. Gibbons. When he died, widely honored and lamented, the society of Friends offered a place for his remains in their cemetery; but his burial was in Greenwood cemetery, his children remembering that the society had excommunicated him, and deferring to his own express desire. Mr. Hopper was twice married, and 10 of his 16 children survived him. His life, by Mrs. L. Maria Child, was published in 1853.

HOPPIN, AUGUSTUS, b. R. I., 1828; graduated at Brown university, 1848. Disliking the legal profession, which he had selected in the first instance, he turned his attention to art and went abroad to study paintings and engravings. Upon his return he devoted himself to drawing and to the illustration of books, in which he has for years attained great popularity. His pictures in *Nothing to Wear*, *Potiphar Papers*, and *The Autocrat of the Breakfast Table* are widely known.

HOPPIN, JAMES MASON, D.D., b. R. I., 1820; graduated at Yale, and took a theological degree at Andover. In 1861 he was made professor of homiletics in Yale college. He was for many years pastor of Crombie-street church, Salem, Mass. Among the works he has published are *Old England, its Art, Scenery, and People*; *The Office and Work of the Christian Ministry*; and *Notes of a Theological Student*.

HOP-TREE, *Ptelea trifoliata*, an American shrub of the rue family, called also *shrubby trefoil*, *wafer ash*, and *wingspeed*, growing in rocky places from Pennsylvania to Wisconsin and southward. It usually grows from 6 to 10 ft. in height, but when well trimmed and cultivated sometimes attains a height of 30 ft. or more. Leaves, trifoliate; leaflets, ovate and pointed, and downy when young; flowers, in terminal cymes on new shoots, greenish, small; polygamous—staminate, pistillate, and perfect ones being on the same plant; fruit, 2-celled, 2-seeded, having a broad wing resembling that of the elm (*ptelea*.) The fruit is very bitter, but does not possess the aromatic principle of the hop (*humulus lupulus*). The flowers have a disagreeable odor; the fruit has been used, it is said,

in making beer. The bark and root are the parts used in medicine. When dried it has a peculiar, somewhat aromatic smell and a bitter, pungent acrid taste. Dr. Potter considers it, in the form of a tincture, a valuable remedy in dyspepsia and low fevers connected with gastric irritation. The bark as analyzed by Mr. Steer contains an acrid, bitter oleo-resin; starch; albumen; a yellow coloring substance; and salts of lime, potassa, and iron; also the alkaloid *berberin*, probably the tonic principle.

HOR, a mountain of Arabia Petraea, on the confines of Idumaea, and forming part of the mountain of Seir or Edom. It is generally regarded as the modern *Jebel Haroun*, or Mount Aaron, lying midway between the Dead sea and the Eilatitic gulf. On the summit of this hill is a tomb venerated by the Mohammedans as the sepulcher of the high-priest Aaron.

HORÆ, or **THE HOURS**, who in ancient fable had charge of the gates of heaven, and are variously represented. According to Hesiod they watched over the works of men, while an unknown poet claims for them the distribution of time and calls them the children of the year. Probably they were originally three in number, on that account answering to the three periods into which the early Greeks divided their year. And later on, when the day came to be definitely apportioned into 12 hours, the poets sung of an equal number of Horæ as the guardians of those portions of time. As guardians of the seasons with their regular alternations, they soon came to be looked upon as representatives of the moral qualities, and Hesiod immortalized them as presiding over law, justice, and peace, and as diffusing harmony and order among men. Homer allegorically represents them as ministers of Jupiter and rulers of storm and cloud. They attended the goddesses at the Olympic festivals, and showered blessings upon mortals. The Hora of spring is represented in sculpture as attendant upon Venus when she sprang from the foam, and of Proserpine when she returned from the lower regions.

HOREHOUND. See **HOARHOUND**, *ante*.

HORGEN, or **HORCHEN**, a t. in Switzerland, on the lake of Zurich, 7 m. s. of Zurich city; pop. '70, 5,311. The main business is manufacturing of cotton and silk goods and chemicals.

HORICON LAKE, in Dodge co., Wis., extending into Fond du Lac co.; about 15 m. long and 5 m. wide; finding its outlet through Rock river into the Mississippi. It is shallow, and water-plants flourish on its surface.

HORICON, LAKE. See **GEORGE, LAKE**.

HORITES, descendants of Hori, grandson of Seir, a people who dwelt in and around Mt. Seir before the Canaanites took possession of Palestine. The Scriptures give their genealogy, and say that they were divided into seven tribes. They were smitten by Chedorlaomer and the kings of the east, when they invaded Sodom in the days of Abraham. They were overcome, and perhaps absorbed by the Edomites, who adopted their habits. They lived in dwellings excavated in the sandstone cliffs, and the ruins of their homes, especially in the Petra, are among the most remarkable of ancient remains.

HORN, **GUSTAF CARLSSON**, 1592-1657; b. Sweden; educated at Tübingen, and was trained in military science in Holland under prince Maurice. He took service in the army of Sweden in 1624, and participated in all the victories of Gustavus Adolphus, who called him his "right arm." After the battle of Lützen, Horn conducted the successful campaign in the Rhenish provinces, but at the battle of Nördlingen he was captured and detained a prisoner for seven years. When at last he was liberated by exchange, he joined in the campaign against the Danes, and in 1651 was made a field-marshal.

HORN, or **HOORNE**, **PHILIP II. DE MONTMORENCY-NIVELLE**, Count of, 1522-68; a Dutch nobleman who was murdered by the duke of Alva. While he was still a boy, his mother married, a second time, John, count of Horn, and, through his influence, Philip was nominated governor of Zutphen by the Spanish king. He also became admiral of the Flemish fleet, and counselor of state. He distinguished himself at St. Quentin and Gravelines. After spending many years in Spain, he returned to his native land, and joined Egmont in resistance to the policy of Philip. He resisted the introduction of the inquisition into Holland. He was tolerant in principle, and on one occasion used his influence in preventing a massacre of Roman Catholics at Tournay. He struggled vainly against the oppressive measures of Philip and of Margaret, regent of the Netherlands. Philip, desiring at last to rid himself of Horn, Egmont, and others of their party, sent the infamous duke of Alva to Holland as his representative. Alva enticed Egmont and Horn into the city of Brussels and had them arrested. They were summarily brought to trial and executed.

HORNE, **GEORGE**, 1730-92; b. England; educated in the school of Maidstone, whence he passed to university college, Oxford. He afterwards became a fellow, and finally principal, of Magdalen college. In 1771 he was chosen chaplain in ordinary to the king, and held that office for ten years. In 1776 he became vice-chancellor of the university; five years later he was made dean of Canterbury; and in 1790 was promoted to the see of Norwich, which he retained till his death. Bishop Horne's only important

work, his *Commentary on the Psalms*, exhibits a deep acquaintance with Hebrew and biblical lore, and is marked by a spirit of earnest piety. It has been frequently reprinted. His other works, for the most part fugitive pieces of a controversial character, are now forgotten. The best of them were written to defend the views of Hutchinson in opposition to those of sir Isaac Newton, which latter, until he understood them thoroughly, he at first believed at variance with Scripture and subversive of its teachings.

HORNE, RICHARD HENGIST, b. London, 1803; receiving a military education, served in the first instance as a midshipman in the Mexican navy until the conclusion of the war of independence. Then returning to England, he devoted himself to literature and wrote several tragedies, many of them with ironical and sarcastic meanings. In one of his books, *Orion, an Epic Poem*, he announced on the title-page that the price was one farthing, in allusion to the public depreciation of epic poetry. This satire obtained a ready sale and went through three editions, each of which increased it in price. Tiring of English life, Horne went to Australia; and afterwards published *Australian Facts and Principles*. He is a prolific writer and contributor to many of the periodicals.

HORNED FROG, or HORNED TOAD, a lizard of the genus *phrynosoma*. It has some resemblance to a toad or a frog, but is not a batrachian, but a saurian. The genus comprises about a half-dozen species, all North American, the best known of which are *P. Douglassii*, *P. Blainvillii*, and *P. cornutum*. Capt. Stansbury's *Expedition to the Great Salt Lake* contains full descriptions of them by Messrs. Baird and Girard. The name horned frog has also been given to a batrachian of the genus *ceratophrys*, which has a spiny head. It is a native of tropical South America, and is three or four times as large as a common frog, and feeds upon other frogs, small birds, rodents, and mollusks.

HORNED POUT. See CATFISH.

HORNELLSVILLE, a village in the t. of the same name in Steuben co., N. Y., on the New York, Lake Erie, and Western railroad, and on Canisteo river, 60 m. s. of Rochester; pop. of township, 8,879. The village has six churches, a convent, a public library, four newspapers, a free academy, a business college, and many manufactories.

HORNER, FRANCIS, 1778-1817; b. Scotland; educated at the Edinburgh university, and started in the practice of law. He contributed in early life to the *Edinburgh Review* some very able papers. In 1806 he was elected a member of parliament, and siding with the whigs became renowned in debate on questions of finance and political economy. He was in favor of free trade and metallic currency. He took a leading part in the great bullion question, and drew up the first report on the subject. It was mainly due to his influence that restrictions were placed upon the issue of paper money. In private life his character stood extremely high. Sidney Smith said of him: "The commandments were written on his face, and I have often told him that there was not a crime he might not commit with impunity, as no judge or jury who saw him would give the smallest degree of credit to any evidence against him; there was in his look a calm, settled love of all that was good and honorable, an air of wisdom and sweetness; you saw at once that he was a great man, whom nature had intended for a leader of human beings; you ranged yourself willingly under his banner, and cheerfully submitted to his sway."

HORNER, WILLIAM EDMONDS, 1793-1853; b. Va.; graduated at the university of Pennsylvania, and became a surgeon in the U. S. navy. He subsequently practiced medicine in Philadelphia with great success. He was prosecutor and demonstrator of anatomy in the university of Pennsylvania, and adjunct professor of anatomy in 1819, and full professor in 1831. In 1847 he founded St. Joseph's hospital. In 1824 he announced the discovery of the muscle known as "Horner's muscle." He published a number of medical works, including *Pathological Anatomy; Practical Anatomy; Special Anatomy and Histology; The United States Dissector*; and an *Anatomical Atlas*.

HORRY, a co. in e. South Carolina, bordering on North Carolina and the ocean; crossed by the Wilmington, Columbia, and Augusta railroad, and intersected by the Waccamaw river; 1000 sq.m.; pop. '80, 15,574-4,935 colored. It has a level surface with many marshes. The productions are rice, sweet potatoes, and pork. Co. seat, Conwayborough.

HORRY, PETER, a native of South Carolina; soldier in the revolutionary army; serving as a brig.gen. with Francis Marion, whose biography he wrote in conjunction with Weems.

HORSA. See ANGLO-SAXONS, *ante*.

HORSE-EATING. See HIPPOPHAGY.

HORSE, FOSSIL, in general terms, the fossil remains of animals which have been classified as belonging to the *equidae*, or horse family. These remains are all confined to the tertiary formation, with the exception of a few, which are recent. They have been found in the eocene, pliocene, and miocene of Europe and America, but the greatest number and the most perfect gradation are found in North America, which, it is claimed, gives evidence of descent from the *cohippus* of the eocene to the present one-toed horse. Thirty-five or forty species, which compose several genera, are said to have been discovered, the classification having been made upon variations in the form and size of the

skeleton. Different forms were found from time to time, and although it was believed that they were links in a chain of organisms which connected the horse zoologically with the cohippus, they were broken links, and no perfect chain could be formed out of them. Now, however, it is claimed that the chain is complete, all the missing links having been found, principally by Prof. O. C. Marsh, of Yale college, in the tertiary beds of our western territories. The ungulates, the sixth order of the class mammalia, are divided into two sections—those in which the toes are odd in number, and those in which they are even. The horse family, *equidae*, belongs to the odd-toed section, which also contains the rhinoceros and the tapir. It is the seventh and last family, and is now regarded as containing seven or more genera. These genera are all extinct, and known only in the fossil state, except the present species, *equus caballus*. The argument for the gradual evolution of the horse through these extinct genera is well though briefly stated by Prof. Joseph Le Conte (*Elements of Geology*, N. Y. 1878), in a chapter on the age of mammals, in which he traces indications of evolution in other animals, one of these being the gradual enlargement of the brain-cavity, and says: "In conclusion it will be interesting and instructive to run out one of these branches and show in more detail the genesis of one of the extreme forms. For this purpose we select the horse, because it has been somewhat accurately traced by Huxley and Marsh. About thirty-five or forty species of this family, ranging from the earliest eocene to the quaternary, are known in the United States. The steps of evolution may therefore be clearly traced. In the lowest part of the eocene basin (coryphodon beds) of Green river is found the earliest known animal which is clearly referable to the horse family; viz., the recently described cohippus of Marsh. This animal had three toes on the hind-foot and four perfect, serviceable toes on the fore-foot; but, in addition, on the fore-foot an imperfect fifth metacarpal (splint), and possibly a corresponding rudimentary fifth toe (the thumb), like a dew-claw. Also, the two bones of the leg and forearm were yet entirely distinct. This animal was no larger than a fox. Next, in the middle eocene (Bridger beds), came the orohippus of Marsh, an animal of similar size, and having similar structure, except that the rudimentary thumb or dew-claw is dropped, leaving only four toes on the fore-foot. Next came, in the lower miocene, the mesohippus, in which the fourth toe has become a rudimentary and useless splint. Next came, still in the miocene, the miohippus of the United States and nearly allied anchitherium of Europe, more horse-like than the preceding. The rudimentary fourth splint is now almost gone, and the middle hoof has become larger; nevertheless the two side-hoofs are still serviceable. The two bones of the leg have also become united, though still quite distinct. This animal was about the size of a sheep. Next came, in the upper miocene and lower pliocene, the protohippus of the United States and allied hipparion of Europe, an animal still more horse-like than the preceding, both in structure and size. Every remnant of the fourth splint is now gone; the middle hoof has become still larger, and the two side-hoofs smaller and shorter, and no longer serviceable except in marshy ground. It was about the size of the ass. Next came, in the pliocene, the pliohippus, almost a complete horse. The hoofs are reduced to one, but the splints of the two side-toes remain to attest the line of descent. It differs from the true horse in the skull, shape of the hoof, the less length of the molars, and some less important details. Last comes, in the quaternary, the modern horse—*equus*. The hoof becomes rounder, the splint-bones shorter, the molars longer, the second bone of the leg more rudimentary, and the evolutionary change is complete."

The following tabular statement will give a good idea of the relations of the genera of the horse family at a glance.

EQUIDÆ, OR HORSE FAMILY.

1. *Eohippus*: lower eocene of New Mexico. Animals of this genus small, about the size of a fox; fore-feet having four toes with a rudimentary thumb; hind-feet three toes, all the digits terminating in hoofs; bones of leg and forearm entirely distinct.

2. *Orohippus*: found in beds somewhat above the latter; about the size of a fox; fore-feet four-toed; third digit largest; hind-feet three-toed; all trace of thumb of cohippus gone; and the last premolar resembles the molars instead of the premolar in front of it, as in cohippus. Canines large and widely separated from the molars. Dental formula same as in cohippus, viz.:

$$i \frac{3-3}{3-3}; c \frac{1-1}{1-1}; pm \frac{4-4}{4-4}; m \frac{3-3}{3-3} = 44.$$

3. *Mesohippus*: lower miocene, N. A. About the size of a sheep, but having longer legs; hind-feet three-toed; fore-feet three-toed, but having rudimentary metacarpal (splint-bone), representing the little finger; last two premolars resemble the molars.

4. *Miohippus*: upper miocene, N. A. Animal rather larger than a sheep; all the feet three-toed, toes of nearly equal size; the little finger of the left hand has the same rudimentary metacarpal as in the preceding; no antorbital fossa.—*Anchitherium*: genus of European miocene, allied to miohippus, but having many characteristics resembling the paleotherium, so that it may be regarded as transitional between equidæ and paleotheriids; species about the size of a sheep; all the feet are three-toed, and all the toes touch the ground, but middle toe larger in proportion than in preceding, and

there is no representative of the little finger; differs from *miolhippus* in having a large antorbital fossa.—*Hipparion*: later southern European miocene and pliocene periods, skeleton like that of horse in general conformation; feet three-toed, but middle toe much the largest and the only one of any use or that touches the ground.

5. *Protohippus*: lower pliocene of N. A. This is considered the North American equivalent of the European *hipparion*, although larger than the latter, some species having been about the size of the ass. The formation of the feet was the same as in *hipparion*.

6. *Pliohippus*: pliocene. Feet resemble in structure the modern horse or genus *equus*; that is, there is only a single functional toe, the second and fourth toes being rudimentary (splint-bones). This genus, however, differs from *equus* in having a large antorbital fossa, and also in having an additional upper premolar, the dental formula being as follows.

$$i \frac{3-3}{3-3}; c \frac{1-1}{1-1}; pm \frac{4-4}{3-3}; m \frac{3-3}{3-3} = 42.$$

7. *Equus*. This genus, which includes the modern horse, is thought to have made its appearance at the close of the miocene or commencement of the pliocene period. In the old world the first appearance of true horses is thought to have been in the *equus siculensis* of the Siwalik hills in the upper miocene or lower pliocene. In the pliocene of Europe, North America, and South America the genus is well represented, and the *equus fossilis* of the post-pliocene and recent periods is specifically undistinguishable from the existing *equus caballus*. (Nicholson.)

The dental formula of the horse is as follows:

$$i \frac{3-3}{3-3}; c \frac{1-1}{1-1} \text{ or } \frac{0-0}{0-0}; pm \frac{3-3}{3-3}; m \frac{3-3}{3-3} = 40.$$

The above statement is an outline of the argument in favor of the theory that the horse (as well as all the members of the animal and also of the vegetable kingdom) is the result of gradual evolution. The objectors to this theory do not deny that there are close relations in structure, or that there *might* have been great similarity in the habits of the different genera, as they have been classified; but they deny that there is any evidence which indicates that one genus was the progenitor of another, or that the various species, of which there are more than thirty, were ever produced from one origin. It is held that there is nothing to warrant the conclusion that the *cohippus* should lose his thumb and pass into the genus *orolhippus*, or that the latter should all at once pass from the size of a fox to that of a sheep and lose one of the four toes of his fore-foot. On the contrary, it is held that there are structural characteristics in the genera which warrant the conclusion that one genus was not the progenitor of another, or that one was not derived from the other by any law of natural selection.

In *miolhippus*, for instance, there is no antorbital fossa, while in *anchitherium*, which is said to follow in development, there is. It might, however, be said that the latter is a European type; but the American *pliohippus* of the pliocene beds—the genus which immediately precedes that of the horse, or *equus*, as the next fossil form is held to be—has also a large antorbital fossa, while the latter has not. Again, the genus *equus* in the above arrangement, and which is the last of seven genera in a scale of progression, has been classified by some, including Dr. J. E. Gray, the eminent British naturalist, as distinct from that of the ass and zebra, which they place in the genus *asinus*. Linneus and Cuvier, however, placed all three in the genus *equus*. But it is held that, whether classed as two genera or one, they present the same distinctive characteristics which they had more than 4,000 years ago, and that there is no evidence for a belief that they are not distinct creations, notwithstanding that the skeleton characteristics of these animals are precisely similar (Cuvier's reasons for placing them in one genus), there being no anatomical differences. How then, it is asked, if the horse and zebra and ass differ so widely, even when having the same kind of skeleton, can it be held that skeletons of animals differing as much as *miolhippus* and *pliohippus*—the latter having a large antorbital fossa while the former had none, and having one toe while the former had three—belong to the same family, and stand so closely related that one has sprung from another? There are many fishes whose skeletons have greater similarity than obtains in the fossil horse family, but whose other characteristics are entirely distinct, and it is held that there is no evidence of their ever having been otherwise. On the other hand, it is not denied that there is the highest evidence of a plan in creation furnished by the discovery of these fossil horses, as they are called, as there are other evidences of a plan exhibited in all the works of nature. But it is said that while they furnish evidence of a plan, they furnish evidence also that that plan was carried out by distinct creations from the peculiar anatomical differences, as noticed above, and which cannot be accounted for by any law of differentiation in the species or genus which should cause it to deviate from *miolhippus* to *pliohippus*, and from the latter again to *equus*, *miolhippus* having no antorbital fossa—*pliohippus* having large antorbital fossa, and *equus*, again, having none. In view of the facts and arguments on both sides, it

is probably safe to say that the evolution in the instance referred to is, at least, not yet proved. It remains an ingenious and interesting hypothesis.

HORSE MACKEREL. See *TUNNY*, *ante*.

HORSE-RACING (*ante*). The racing of one horse against another is probably coeval with their subjection to the use of man, but racing as understood at the present time is of comparatively recent date. Something like jockeyship, however, was practiced in very early times, the Greeks having introduced it at their celebrated games. In the 33d Olympiad they had their race of full-aged horses, and in the 71st Olympiad a race for mares called the Calpe was instituted. In the 131st Olympiad a race for under-aged horses was established, but we are left in doubt as to the weight the horses carried, or the distance they ran. Alexander the great is said to have been ambitious of obtaining the Olympic crown, and although Macedonians were excluded, the Elean jockey club allowed him to start; but he did not win. Themistocles objected to Hiero, king of Syracuse, as a tyrant, and proposed that the magnificent pavilion containing his race-horses should be pulled down, but the objection was overruled, and he became a winner. Horse-races were known in England in very early times. An old black-letter pamphlet, containing the poetical legend of sir Bevis of Hampton, mentions Whitsuntide as a season of the year at which races took place, and goes on—

Whiche horse that best may ren
Three myles the course was then,
Who that might ryde him shoulde
Have forty pounds of redy gold.

That horse-racing was commonly practiced at Easter is proved by the fact that, in the 17th c., it was prohibited "as being contrary to the holiness of the season." Fitz-Stephen, in the days of Henry II., mentions the delight taken by the citizens of London in the diversion. James I. made the sport a royal amusement, and set the example of paying large prices for foreign horses of supposed superior breed. Craydon in the south and Garterly in the north were celebrated courses. In the reign of Charles I. races continued to be held, the most noteworthy being the meetings in Hyde park and at Newmarket. The precedent was established of giving as prizes silver cups, instead of coin. Charles II. encouraged the sports of the turf, and under his reign they became national in England. The Godolphin Arabian, the progenitor of the best blood, appeared in the reign of George II. In the commencement of that of George III., Eclipse was foaled, and at that time racing, as now understood, was really established. The first racing calendar is said to have been published by John Cheney in 1727. The most eminent races in England are those at Newmarket, established in 1667, and at Epsom, inaugurated about 1711 by Mr. Parkhurst, and which were made annual after 1730. The earl of Derby began the "Oaks" in 1779, it being so called after his seat in the neighborhood. The Derby, which was first won by Diomed in 1780, generally takes place on the Wednesday in the week preceding Whitsunday. The winners from 1876-79 were Kisber, Silvio, Sefton, and Sir Bevy's. In 1880 it was won by Bend Or in 2 minutes 46 seconds, the course being a mile and a half in length. The Ascot meeting is the next great racing festival after the Derby, and was begun in 1727 by the duke of Cumberland, uncle to George III. The St. Leger stakes were founded at Doncaster in 1776. The races at Goodwood were first held in 1802. The Jockey Club, which now chiefly regulates races and the betting connected with them, was founded in 1750. Flying Childers, bred in 1715 by the duke of Devonshire, was the fleetest horse that ever ran at Newmarket. He ran 4 m. in 6 minutes and 48 seconds. Eclipse, the fleetest horse in England since the time of Childers, was never beaten, and died in 1789, aged 25 years. The grand prize of Paris, for which the best English and continental three-year-olds compete, was established by Napoleon III. Since 1856 there has been a race-course at Longchamps, within an easy drive of the capital.

It will be some time before horse-racing in America attracts the attention or assumes the importance that it has done in England. Nevertheless, racing is fast becoming a national sport. Jerome park, in Westchester co., N. Y., is the American Epsom downs. The arrangements are complete, and may challenge comparison with any of the great race-courses of Europe. It was opened in 1866, and under Mr. Jerome's leadership the club in connection with it have made racing agreeable and respectable, and the presence of ladies from New York assures for it the character of a popular and reputable recreation. The Brighton Beach fair-grounds at Coney island, an enterprise which was started a few years ago at a cost of \$300,000, furnishes one of the best courses in the country, and is certain to obtain popularity. There are also excellent races at Monmouth park near Long Branch, Sheepshead bay and Saratoga Springs, N. Y., Point Breeze park of Philadelphia, Lexington, Ky., Baltimore, Louisville, New Orleans, Rochester, Buffalo, Chicago, Boston, Springfield, Hartford, and at many other places.

The trotting horse of America is a really distinct variety, of the equine race. Hiram Woodruff developed the breed and made it famous. The best American trotters are descended from an imported English horse named Messenger, of which Mr. George Wilkes said, in an often quoted passage, that "when Messenger came charging down the gang-plank of the ship which brought him over, the value of not less than one hundred millions of dollars struck our soil." Hambletonian was the grandson of Messenger,

and it is asserted that if he had been broken and trained as a trotter, his own name would have gone down to posterity in company with that of his son Dexter, Flora Temple, Lady Suffolk, Goldsmith Maid, and other animals capable of the greatest achievements on record. In 1874 Goldsmith Maid trotted a mile in harness in the surprising time of 2 minutes 14 seconds, beating the record of Dexter by $3\frac{1}{2}$ seconds. This great performance was eclipsed in 1878 by Karus, who trotted a full mile at Buffalo in 2 minutes 13 $\frac{1}{2}$ seconds, and by St. Julien in 1879, who trotted a mile at Oakland, Cal., in 2 minutes 12 $\frac{3}{4}$ seconds, improving this record in 1880 at Hartford, Conn., to 2 minutes 11 $\frac{1}{4}$ seconds. But the fastest time in the records of the turf is that of Maud S., who startled the racing community by trotting a mile at Chicago, Sept. 18, 1880, in 2 minutes 10 $\frac{3}{4}$ seconds. One mile has also been trotted in less than 2 minutes 17 $\frac{1}{4}$ seconds, the best time of Dexter, by the following horses: Smuggler, 2:15 $\frac{1}{4}$; Great Eastern, under saddle, 2:15 $\frac{1}{4}$; Hopeful, to wagon, 2:16 $\frac{1}{4}$; Lula, 2:16 $\frac{1}{4}$; Occident, 2:16 $\frac{1}{4}$; American Girl, 2:16 $\frac{1}{4}$; Gloster, 2:17. The best time in harness, for 2 m., is 4 minutes 48 $\frac{1}{4}$ seconds, made by Steve Maxwell at Rochester, N. Y., Aug. 10, 1880, beating the record of Flora Temple by two seconds and that of Dexter by two seconds and a half.

It is but a short time since thorough-bred racing has become a formidable rival in America to the national sport of trotting. The public interest, however, has been awakened by the brilliant triumphs of Mr. Lorillard's Parole, beating in 1879 English horses upon their native heath. Ten Broeck has made the excellent record of 1 m. in 1 minute 39 $\frac{3}{4}$ seconds; 2 m. in 3:27 $\frac{1}{2}$; 3 m. in 5:26 $\frac{1}{2}$, and finished 5 m. in 7:15 $\frac{1}{2}$. The celebrated steeple-chaser Trouble is the best cross-country horse that has appeared in this country for many years. Among many other fine race-horses are General Philips, Vera Cruz, Duke of Magenta, Tom Ochiltree, Cloverbrook, Mollie McCarthy, Bob Wooley, and Tom Bowling. During 1880 the best records of previous years have been beaten by Bramboletta and By-the-Way running $\frac{3}{4}$ m. in 1:2 $\frac{1}{4}$; by Barrett and Knight Templar running $\frac{3}{4}$ m. in 1:14; by Blackburn running 1 $\frac{1}{2}$ m. in 2:34, and Monitor finishing 1 $\frac{1}{4}$ m. in 3:2 $\frac{3}{4}$. See DERBY DAY, *ante*.

HORSETAIL. See EQUISETUM, *ante*.

HORSE-TAMING.. The taming of horses to increase their value and usefulness has been attempted in all countries where the equine race has flourished. But the credit of first reducing the art to a system belongs to John S. Rarey, whose treatise, originally published in America, and republished in 1858 in England and France, went through a large number of editions, and is still considered an authority on the subject. One of his greatest triumphs was in England over the racing colt Cruiser, which was so vicious that he had killed several grooms, but was completely tamed by Rarey, and afterwards brought to America. The system is founded on a profound study of the disposition of the animal. In contrast with the usual mode of training by harsh words, a sharp whip, and cruel worrying, he demonstrates how easily, quietly, and safely horses may be tamed by kindness.

The education of the horse should be that of the child. Pleasure should be as much as possible associated with the early lessons, while firmness and coercion, when necessary, must establish the habit of obedience.

The first step towards the breaking of a horse is placing a halter upon his head, and can be easily accomplished by a little dexterity and caution. The colt should then be taking to the longeing ground and taught to lead. The large, smooth snaffle, with keys depending from its central ring, is considered by many trainers to be the best bit for mouthing purposes. After the colt has been shod, and has been driven about the roads in reins for a few days to accustom him to shoes, he may be saddled, but at first without stirrup-straps or stirrups, as they act as alarmants. Before breaking a horse to harness he should previously have been well mouthed, and broken to the saddle. The hames and traces should be omitted on the first day, and the harness should be so constructed that the tugs open from above, allowing the shafts to drop into them. The two-wheeled break should be strong and high on the wheels, that the splinter-bar may be high, and so prevent the animal kicking over it. Bearing-reins are useless and cruel, as the horse is made to suffer great pain, and cannot pull to the full extent of his power when his head is kept in a constrained position.

HORSLEY, CHARLES EDWARD, b. England, 1824; studied music in Germany, passing some months with Mendelssohn, and studying under Moritz Hauptman and Spohr. Owing to the failure of his health he went to Australia in 1861, and in 1873 came to New York, where he became organist in St. John's (Prot. Epis.) church. He has published three oratorios, three cantatas, and a number of shorter compositions.

HORSLEY, JOHN CALLCOTT, b. England, 1817; a painter who has produced a great number of works, and is especially successful in genre painting. In 1843 he won a prize for his representation of "St. Augustine Preaching," and was engaged upon the cartoons for the new houses of parliament. Some of his productions are "L'Allegro and Il Penseroso," "Under the Mistletoe," "Caught Napping," "Scenes from Don Quixote," and "Healing Mercies of Christ."

HORSLEY, WILLIAM, 1774-1859; b. England; became a musician of celebrity. He studied under Dr. J. W. Callicott, whose daughter he married. He was the author of many popular glees.

HORTA, a seaport in the Azores, the capital of the island of Fayal; pop. 7,636. It possesses a safe and good harbor.

HORTENSE EUGÉNIE DE BEAUHARNAIS. See **BONAPARTE**, *ante*.

HORTENSIVS, **QUINTUS**, 114 B.C.—50 A.D.; b. Rome; famous as a lawyer and an orator, attracting general attention before he was 20 years old. It is said that he was unscrupulous in his efforts to win any cause that he pleaded, and was not above the use of bribery. Although he was the political and legal foe of Cicero, personally the two orators were friends; but at one time Cicero accused Hortensius of duplicity. Hortensius was questor, ædile, pretor, and consul. His private life was luxurious and to some extent immoral.

HORVÁTH, **MIRÁLY**, b. Hungary, 1809; took holy orders in 1830, and in 1844 became professor of the Hungarian language and literature at Vienna. At the time of the revolution in Hungary he was minister of public worship and education; after its suppression he was expatriated until 1866, when he obtained permission to return to his native country. He is the author of a *History of Hungary*.

HOSACK, **DAVID**, LL.D., 1769–1835; b. New York; graduated at Princeton in 1789; studied in Europe, and in 1795 was chosen professor of botany in Columbia college, and in 1797 of materia medica. In 1807 he became professor of materia medica and of midwifery in the college of physicians and surgeons, then newly founded, and subsequently of the theory and practice of physic, and of obstetrics and the diseases of women and children. He was the founder of the first botanic garden in the U. S. He was concerned with Drs. Mott, Macneven, and Francis in organizing the medical department of Rutgers college, at New Brunswick, N. J. In New York city he filled various medical offices in asylums, hospitals, and for the city in general. He was also one of the originators and for 12 years president of the New York historical society, and was a fellow of the royal society of Great Britain.

HOSANNA, a Hebrew word, meaning *Save, we pray*. At the feast of tabernacles the Jews carried branches of the palm and myrtle tree, repeating verses 25 and 26 of Psalm cxviii., which begins with hosanna. The expression became a term of acclamation, and was applied to the prayers of the several days during which the feast lasted. The feast itself was called the Great Hosanna, and the term was more especially applied to the seventh day of the feast.

HOSEA, **Book of** (*ante*). The term of 55 or 60 years from the latter part of Jeroboam II.'s reign to the first part of Hezekiah's, spoken of as marking the continuance of Hosea's prophetic office, though long, is not improbable or at all unprecedented. The style of the book has been described by critics as pointed, energetic, and concise. Jerome admired it for its great condensation and consequent brevity. But these very qualities in so ancient a writing often make the particular meaning obscure even when the general drift is plain. In so small a book, remaining as the only representative of so long a life's work, and recording prophecies that have no marks to distinguish the times of which they treat, it is not surprising that many passages are hard to be understood. The scope of the book is to reprove the nation generally, and the ten tribes in particular, for their gross idolatry and other aggravated sins; to foretell the rejection and captivity of Israel if they persisted in their evil, and to call them to repentance with promises of future restoration and ultimate conversion. The 14 chapters admit of being divided, somewhat more particularly, into five parts: I. i.—iii. The spiritual unfaithfulness of Israel is figuratively represented; yet a remnant of them, it is promised, shall be saved; consequently they are exhorted to forsake idolatry. Promises follow concerning their conversion to faith in the Messiah, and the gracious purposes of the Lord towards them are figuratively set forth. II. iv.—vi. 3. The prophet condemns the bloodshed and idolatry of Israel, and warns Judah against pursuing a similar course. He threatens divine judgments upon the priests, princes, and people; yet holds out promises of pardon expressed emblematically by the morning, the rain, and the resurrection, with remote reference to the resurrection of Christ on the third day. III. vi. 4—viii. The prophet utters God's complaint concerning the obstinate idolatry and other sins of the people, and says that, notwithstanding their reliance on Egypt, they shall be carried captive into Assyria. IV. ix.—xiii. 8. The captivity and dispersion of Israel are again foretold. The people are reproved for their idolatry, yet are not to be utterly destroyed. Their return to their own land is promised, even while threatenings against their idolatry are renewed. V. xiii. 9—xiv. After denunciations of divine judgments mingled with promises of deliverance from captivity, the prophet exhorts Israel to repentance, furnishes them with a model of prayer adapted to their situation, and foretells their abandonment of idolatry together with their subsequent restoration and conversion.

HOSIUS, "THE SAINT" (256–359), b. either in Egypt or Spain, became bishop of Cordova about 296 A.D., and retained the office more than 60 years. He was a member of a council held at Elvira, near Granada, about 305. Having suffered persecution during the reign of Diocletian and Maximian, he was greatly honored for his steadfast faith. He is said to have contributed to the conversion of Constantine by showing him that Christianity excelled heathenism in being able to grant forgiveness even to the

greatest sinners. The emperor afterwards continued strongly attached to him, and in 324 sent him to Alexandria to mediate between the bishop of that city and Arius, as well as to settle the dispute concerning the observance of Easter. His mission having proved too hard for him, in the following year the council of Nicea was called for the purpose of considering both subjects. Of this council Hosius was either the president or, at least, one of its presiding officers. Baronius claims that he was also the pope's legate; this claim, however, is generally denied, with the admission that through his exalted character and great influence in the west he perhaps in some degree unofficially represented the pope. At the close of the council he drew up or, as some say, announced the decree, signed it first and prevailed on the emperor to sanction it. He was president of the council of Sardica, called in 347 by Constantius and Constans at the desire of Athanasius. In 355 Constantius requested him to join in condemning Athanasius, but, instead of doing so, Hosius earnestly defended that zealous champion of the orthodox faith. Having persisted in this course a second and even a third time, he was, at the close of the year, banished by the emperor. Two years afterwards he was summoned to attend the council of Sirmium, where, worn out with extreme age and hardship, he was prevailed on to sign a document favoring Arianism, yet he steadfastly refused to condemn Athanasius. Having then been allowed to return to his home and office, he died two years after, at the age, probably, of about 103 years. Athanasius and Augustine extol his character, and attribute his partial and late compliance with the imperial demands to the infirmity of age.

HOSPITALS, MILITARY (*ante*). The principles of hospital construction were pointed out by a commission of the French academy of sciences in 1778, and improved in several details by Miss Nightingale, Galton, and others, and in the late American and Franco-German wars. The general principles may be gathered from the following directions. The most important part of a hospital is the ward; that is, the special apartment, or system of apartments, for the reception and care of the patients. It should, if large, be arranged in separate pavilions of one, or at most not more than two stories. These buildings should be about 25 ft. wide, 14 ft. high, and of a length allowing not less than 100 square ft. per bed. In warm climates the height should be greater, and also the floor-space, allowing at least 120 sq. ft. per bed. No one ward should contain more than 32 beds. The windows should be opposite, reaching from 3 ft. above the floor to one foot from the ceiling, and occupy one-third of the wall-space. The floors should be of hard pine or oak (Georgia pine in this country), and perfectly tight. In regard to the walls there are differences of opinion, but it is probable that a plastering of mortar over laths, whitewashed with milk of lime, is the best, on account of its absorbing power, noxious gases being undoubtedly disposed of in this way by oxidation within the porous spaces. A plan of hospital was not unusual in the armies during the late war of the rebellion in America, in which the wards or pavilions were disposed in a radiating form around a circular court, from 100 to 150 ft. in diameter, according to the size of the hospital. A plan of Hicks hospital near Baltimore, Md., is sometimes given as a model. This has a mess dining-room in one of the radiating buildings, rather larger than the others, and the offices and other administration buildings in the court. A better plan was carried out in the hospital at Point Lookout, Md., in which the administration apartments, dispensary, mess-rooms, and surgeons' quarters were placed in a large building occupying a site among the other radiating buildings. The advantage is apparent in the open court that is unobstructed in regard to currents of air, and in the greater cheerfulness of the arrangement, which admits of a free view from one ward to all the others, allowing the convalescent patients who may be sitting in their respective porticoes to greet each other; for wounded and sick soldiers, when they are able to be so, are a very social fraternity. The central court can then be laid out in plats of grass and flower-beds, in the care of which the patients take great pleasure during their often long confinement and absence from family. The plan of the Lincoln hospital at Washington was the arrangement of the wards in the form of an isosceles triangle, they being placed *en echelon*, with the base of the triangle being left open. The triangular space between the wards was occupied by the various administration buildings.

HOT-AIR ENGINE. See CALORIC ENGINE, *ante*.

HOTELS, LAWS RESPECTING. See INN and INNKEEPER, *ante*.

HOTHO, HENRICH GUSTAVE, 1802-73; b. Germany; a writer, and one of Hegel's most distinguished pupils, who became professor of the university of Berlin. He was extremely able as an art-critic, and was for many years director of the art collection in the royal Berlin museum. He published *Vorlesungen über Aesthetik*; *Geschichte der deutschen und niederländischen Malerei die Malerschule Hubert's van Eyck*; and several other able works on art.

HOT SPRINGS, a co. in s.w. central Arkansas, intersected by the Ouachita river, and the Cairo and Fulton railroad; 900 sq.m.; pop., '80, 7,775-745 colored. The surface is hilly and is to a large extent covered with forests. The chief productions are corn, cotton, and pork. Co. seat, Rockport.

HOTTENTOT'S BREAD, *Testudinaria elephantipes*, a species of yam, indigenous to s. Africa. Slender, vine-like stems grow to a height of 30 or 40 ft., with many

branches bearing bright, heart-shaped leaves. The root-stock stands conspicuously above ground, hemispherical or nearly globular in shape, and sometimes 3 ft. in diameter, covered with a brown, cork-like substance with many-sided protuberances separated by deep cracks and fissures. From fancied resemblances of this characteristic root-stock, the plant is sometimes called elephant's-foot, according to its systematic name, and sometimes tortoise-plant. The fleshy interior affords food to baboons and other animals, but it is said that the natives do not eat it. The dormant root-stocks are imported apparently dead, but when placed on the ground soon throw out rootlets, while stems grow rapidly from the upper surface. It is cultivated as a greenhouse curiosity, and its branching stem and pleasing foliage make it a favorite greenhouse climber.

HOTTINGER, JOHANN HEINRICH, 1620-67; a Swiss orientalist and biblical scholar. He first settled at Groningen, and afterwards at Leyden, where he became assistant to Golius, the best orientalist of that age. He also took lessons in Arabic and Turkish from Ahmed Jon Ali, a Mohammedan from Morocco, of whom he often speaks in his works. Golius had hoped to take his pupil with him to the east, but the senate of Zurich interfered, and Hottinger, after visiting France and England, returned home. In 1653 the chairs of rhetoric, logic, and scriptural theology were offered to him, and he had only filled them for two years, when, at the urgent request of the elector of Palatine, he was permitted to remove to Heidelberg for three years. He there taught the eastern tongues and biblical criticism with such success and distinction as to revive and spread the fame of the university. Prolonging his stay in the Palatinate till 1661, he returned to Zurich in that year, and was made rector of the university. His reputation still continued to increase, and in 1667 he received such flattering offers from Leyden that he resolved to accept them. Before setting out for this new sphere of labor the boat on which he was crossing the Limath, with his wife and family, was upset, and Hottinger, who might have saved his own life, was drowned in attempting to save that of his wife.

HOUDIN, ROBERT, 1805-71; b. Paris, and was educated for a lawyer, but at his own request followed his father's trade of a watchmaker. He constructed mechanical toys for the exhibition of Paris in 1844, which were awarded medals. He had an enthusiasm for all feats of conjuring, and originated his *Soirees fantastiques*, or magical performances, for which he afterwards became famous in Europe and America. He visited Algeria at the instance of the French government, with a view of ascertaining how the priests there performed the wonders with which they incited the people to rebellion, and succeeded in surpassing all their marvels, and counteracting their seditious influence. He published his autobiography and his *Confidences*, which were translated into English.

HOUDON, JEAN ANTOINE, 1741-1828; b. Paris; one of the most famous modern French sculptors, excelling in busts or portraits. Among his subjects were Voltaire, Cicero, Napoleon, Josephine, Ney, Rousseau, Diderot, Mirabeau, Franklin, Turgot, and George Washington. His statue of the latter is in the capitol at Richmond, Va. He visited the United States in 1785 with Franklin, and was for some time Washington's guest.

HOUGHTON, a co. in the n.w. part of the peninsula of Michigan, lying along lake Superior and embracing Portage lake, which is connected with lake Superior by a canal; 2,000 sq. m.; pop. '80, 22,473. The surface is hilly; agriculture is much neglected, the main business of the people being copper-mining. The mines of the region are the richest in the world. Co. seat, Houghton.

HOUGHTON, the capital of the co. of the same name in Michigan, on Portage lake, 10 m. from lake Superior, to which there is a ship canal; pop. 1540. There are some manufactories, but the copper trade is the chief business, this being the center of the richest mining district in the country.

HOUGHTON, RICHARD MONCKTON MILNES, Lord, b. England, 1809; graduated at Cambridge, and was elected to parliament in 1837 as a supporter of Peel. He afterwards joined Russell's party, but declined office under Palmerston. His attention was mainly directed to foreign affairs and the reform of penal institutes. He brought in the first bill for the establishment of juvenile reformatories in 1846, and is the president of the great reformatory establishment at Red Hill. In 1873 he presided over the Norwich meeting of the social science congress. He has written several volumes of poems, under the title of *Poems of Many Years; Palm Leaves*, etc., and many pamphlets—notably, *One Tract More*, in the Oxford controversy of the *Tracts for the Times*; and the *Real Union of England and Ireland*, advocating concurrent endowment of the Protestant and Catholic churches. His last work is *Monographs, Personal and Social*.

HOUGHTON, WILLIAM, b. England, 1807; graduate of a London college. In 1833 he became minister of a Congregational church, and in 1855 was chosen president of the Congregational union of England and Wales. He has been a great traveler and is the author of *The Ecclesiastical History of England, and Country Walks of a Naturalist with his Children*.

HOULTON, the seat of justice of Aroostook co., Me., situated at the terminus of the New Brunswick and Canada railroad, the most northerly settlement of any consequence in the wild n.e. region of the state; pop. of township, 2,850. In the village are the Houlton academy, half a dozen churches, and a number of manufactories. It is about 100 m. n.e. of Bangor.

HOU-NAN', or the HU-NAN, one of the provinces of s. central China; 74,325 sq.m.; pop. 18,652,507. The surface is rough, and the region is little known to Europeans. The chief town is Chang-Sha.

HOUD FISH, a name given to certain kinds of sharks, as the *mustelus laevis*, or smooth hound fish of European waters, and its American representative, the *mustelus canis* of DeKay, the dog shark, a rather larger fish than the former, being from 2 to 4 ft. in length. They are sometimes spoken of as a larger kind of dog fish; but the dog fish belongs to the genus *acanthias*. See DOG FISH and SHARK, *ante*.

HOURIS, beings of the Mohammedan paradise; virgins not of human flesh and blood, but formed of musk, and, by a special dispensation, eternally virgins. The name means literally "the black-eyed." In the fanciful story of the Koran these fair creatures dwell in pavilions of pearl, and repose on gorgeous couches. The pious Mohammedan, of however low an origin, is assured of at least 72 of these divine beings in paradise in addition to the wives who belonged to him while he lived on earth. The houris have the power to conceive and bear children at will, who within an hour grow to maturity.

HOURS, in mythology. See HORÆ.

HOUSEHOLD, ROYAL (of Great Britain), the personal attendants upon the reigning sovereign. The establishment was first regulated during the reign of Edward IV. (1461-83), who defined the offices and duties of its members. In the *Household Book* compiled by his orders regulations were made for the table of the king, the daily allowance of provisions, the amount of fuel and lights due to peers of each rank in attendance at court, and all officers and servants on ordinary and festive occasions; gifts, arms, wages, and liveries were also regulated from the highest to the lowest. Subsequent rulers improved upon these regulations. Henry VIII. found it necessary to exclude vagabonds, rascals, and boys from his household. But no definite rules were laid down until 1780, when Burke introduced a plan for radical reform. The expenses were almost beyond belief. Richard II. was always attended by a guard of 200 men, and had also in his retinue 13 bishops, besides barons, knights, and esquires. The household of Edward IV. cost £13,000 a year; that of William and Mary, £15,000. Since the accession of William III., parliament has fixed the amount of appropriation at the beginning of each reign. To the present queen the allowance is £385,000, distributed as follows: privy purse, £60,000; household salaries and retired allowances, £131,260; household expenses, £172,500; royal bounty, alms, and special services, £13,200; leaving an unappropriated balance of £8,040 to be used at discretion. But these sums throw little light upon the comparative grants for the sovereign's household and personal expenses. The lord-steward is the chief officer of the household, and under him are the treasurer, controller, paymaster, almoner, and a number of clerks. The steward has a salary of £2,000 a year. His authority extends over the offices of treasurer, controller, and master of the household, the first two of whom act as his deputies, and all the household officers and servants are subject to his authority except those of the chapel, the chamber, and the stable. The lord-chamberlain is the head of the second division of household officers. A third branch of the household is under the direction of the master of the horse, and embraces the master of the hounds, the grand falconer, the crown equerry, other equeries, and pages of honor. The ladies of the household fill a more important rank in the court of a female sovereign. The mistress of the robes is the head of this department, and under her are the ladies of the bedchamber, the maids of honor, and a great number in subordinate places. The office of mistress of the robes is of ancient and high dignity. She has the superintendence of all duties belonging to the bedchamber, within which the lord-chamberlain has no authority, regulates the rotation and the times of attendance of all the ladies, has the custody of the robes, and on state occasions it is her duty to see that the ceremony of robing the queen is properly performed. She rides in the same carriage with the queen on state occasions. The ladies of the bedchamber are the personal attendants of the queen, and form part of her court. The bedchamber women are subordinate to them. The maids of honor are the immediate attendants of the queen, and accompany her on all occasions. There are other officers attached to the royal household: the dean and subdean of the chapel, with their clerks and chaplains; and, in the medical service, the physicians in ordinary and extraordinary, and surgeons, apothecaries, oculists, dentists, druggists, and chemists. These various officers comprise the queen's household; but in addition to these there are establishments for the prince of Wales and for other members of the royal family. The annuities of the whole family are as follows: the queen, £385,000; prince of Wales, £40,000; princess of Wales, £10,000; crown-prince of Prussia, £8,000; duke of Edinburgh, £25,000; princess Christian of Sleswick-Holstein, £6,000; princess Louise.

(Marchioness of Lorne), £6,000; duke of Connaught, £25,000; prince Leopold, £15,000; duchess of Cambridge, £6,000; duchess of Mecklenburg-Strelitz, £3,000; duke of Cambridge, £12,000; duchess of Teck, £5,000.

HOUSEHOLD GODS, deities supposed among the Romans to preside over their houses, and called *penates*. Among these were Jupiter and Juno. Some of the *penates* were called *lares*, regarded as the *genii* of the family; one of these was Vesta, the guardian of domestic unity.

HOUSEHOLD SUFFRAGE, in English law a necessary qualification for a voter is that he shall be a householder or housekeeper. Male citizens of proper age who have been for 12 months occupiers of a distinct dwelling or part of a dwelling, and have paid assessed rates, are entitled to vote. The suffrage extends also to lodgers occupying uninterruptedly for a similar period, presuming that such lodgings let unfurnished would bring £10 a year.

HOUSAYE, ARSÈNE, b. France, 1815, a poet and art critic. When only 15 years of age he joined the French army which was then besieging Antwerp. For the next three or four years he lived in Paris in extreme poverty, but in 1836 he appeared as an author in *Couronne de Bluts*, a novel. Becoming connected with the *Revue de Paris*, he commenced the publication of his *Men and Women of the Eighteenth Century* in that serial and afterwards republished it in two volumes; and in 1846 he published his *History of Dutch and Flemish Painting*. On the accession of Louis Napoleon, Housaye was appointed to the direction of the theater Français and continued in that office till 1856. Among his works are *L'Histoire du Quarante-et-unième Fauteuil de l'Académie Française*, a series under the title *Parisiennes*, and many novels. He was decorated with the cross of the legion of honor in 1846, and made grand officer in 1858.

HOUSTON, a co. in s.w. Georgia, w. of the Ocmulgee river, intersected by the South-western railroad; 875 sq.m.; pop. '80, 23,251—17,190 colored. It has an undulating surface and much of it is still woodland. The chief productions are cotton, corn, and pork. Co. seat, Perry.

HOUSTON, the extreme s.e. co. of Minnesota on the Iowa border, traversed by the Southern Minnesota railroad, and bounded e. by the Mississippi; 575 sq.m.; pop. '75, 16,566. The surface is undulating and largely covered with forests; soil fertile; chief productions: wheat, corn, oats, and hay. Co. seat, Caledonia.

HOUSTON, a co. in n.w. Tennessee on the Cumberland and Tennessee rivers, crossed by the Louisville and Great Southern railroad; 350 sq.m.; organized since the census of 1870. Surface is hilly; main productions: corn and tobacco. Co. seat, Erin.

HOUSTON, a co. in e. Texas between Trinity and Neches rivers, intersected by the International and Great Northern railroad; 1090 sq.m.; pop. '70, 8,147—3,542 colored. It has a hilly surface largely covered with forests. Cotton and corn are the staple products. Co. seat, Crockett.

HOUSTON, a city, the seat of justice of Harris co., Texas; the great railroad center of the state, 46 m. n.w. of Galveston; pop. '70, 9,382; in '80, 16,756. There is steamboat communication with Galveston. The city has more than a dozen churches, a convent, an academy, six banks, two cotton factories, machine-shops, planing-mills, etc. It is a great shipping place for cotton.

HOUSTON, SAM (*ante*). Although Houston achieved his public reputation mainly through his connection with the history of Texas, yet his life, prior to his settlement in that country, was filled with most romantic incidents, tending to illustrate the strong, original character of the man, and his devotion to his country, and to principles of integrity, as a man and as a citizen. From the time when he commenced the study of law in Nashville (about 1814) to the year 1827, when he was elected governor of Tennessee, he was in a remarkable degree the subject of political preferment. He rose from office to office, being made a member of congress in 1823, when only thirty years of age, and was already esteemed as one whose future promised the highest honors. In 1828 Houston was married to an estimable and beautiful young lady, and surprised the country by leaving her on the day following that of the ceremony, resigning his office of governor of the state, and retiring to the wilds of Arkansas to enable his wife to procure a divorce on the ground of desertion. The secret of this strange action was only made known in the present year (1880), when it was learned from an authentic source that Houston had discovered a prior attachment on the part of his wife, who would appear to have been coerced into her marriage with him, and that, with the natural nobility of his nature, he had willingly sacrificed himself, his social ties, and his political aspirations, to the end that the woman he loved might be made happy. His bride procured the divorce necessary, and some time after married the man of her choice. Houston's conduct was commented upon in terms the most severe, and stories to his disadvantage were freely circulated and generally believed. In the meantime he had made his residence in the Cherokee country, and a year later was the representative of the tribe at Washington. His connection with Texas affairs occurred through a casual visit a year or two after this period, and he was the delegate of the 20,000 Americans—the outgrowth of the Connecticut colony in Texas—to the convention for revision of the Mexican

constitution. Houston resisted secession from its inception, and it is an interesting incident in his life, and in the history of his country, that of his riding close beside the carriage in which sat Lincoln and Buchanan, on the day of the inauguration of the former, guarding the president-elect from the possibility of assassination—which was even then threatened, as it was afterwards consummated. The picture of this stalwart old man, nearly three score and ten, armed and watchful, guarding the person of Abraham Lincoln, is one that deserves to be perpetuated in American history.

HOVEY, ALVAN, b. Vt. 1820; graduated at Dartmouth; studied theology, and became pastor of a Baptist church in Maine. In 1850 he was a teacher in the Newton theological institution; in 1853, professor of theology and Christian ethics. He has published *Life of Chrysostom*; *The State of the Impenitent Dead*; *The Scriptural Law of Divorce*; *Religion and the State*, and other works.

HOVEY, ALVIN P., b. Ind. 1821; brought up to the study and practice of law. He served in the war of the rebellion as an officer of volunteers, and rose to brevet major. In 1866 he was appointed U. S. minister to Peru.

HOWARD, a co. in s.w. Arkansas, drained by a branch of Little river; pop. '80, 9,917. It has a generally level surface and fertile soil. Co. seat, Center Point.

HOWARD, a co. in n.w. Dakota, on the Montana border, bounded on the n. by the Missouri and intersected by Little Missouri river. Area 3,500. Population not ascertained.

HOWARD, a co. in central Indiana, traversed by the Pittsburg, Cincinnati, and St. Louis, and the Indianapolis, Peru, and Chicago railroads; 300 sq.m.; pop. '70, 15,847. It has a level surface, much of it covered with forests, and the soil is fertile. Chief productions: wheat, corn, and pork. Co. seat, Kokomo.

HOWARD, a co. in n. Iowa, on the border of Minnesota, drained by the Upper Iowa river, and intersected by the Milwaukee and St. Paul railroad; 430 sq.m.; pop. '80, 10,837. It has a surface divided into prairie and woodland, and the soil is fertile. The main products are wheat, corn, and oats. Co. seat, Cresco.

HOWARD, a co. in Kansas, bounded on the s. by Indian territory; drained by Fall river and Suicide creek; 1271 sq.m.; pop. '70, 2,794. The soil is fertile, producing wheat, corn, etc. Co. seat, Elk Falls.

HOWARD, a co. in central Maryland, on Patapsco and Patuxent rivers, and the Baltimore and Ohio railroad; 275 sq.m.; pop. '70, 14,150–3,474 colored. The surface is hilly, and the soil fertile; productions: corn, wheat, oats, pork, etc. Co. seat, Ellicott City.

HOWARD, a co. in n. central Missouri, on the Chariton and Missouri rivers, crossed by the Missouri, Kansas, and Texas railroad; 470 sq.m.; pop. '80, 18,428–5,233 colored. The surface is undulating, and the soil is fertile; chief productions: corn, wheat, and tobacco. Co. seat, Fayette.

HOWARD, a co. in e. central Nebraska, on tributaries of Platte river; pop. '76, 1680. The surface is mostly prairie. Co. seat, St. Paul.

HOWARD, a co. in n.w. Texas, situated on one of the forks of the Colorado; 900 sq.miles. There are no permanent white settlers at present.

HOWARD, CATHARINE, 1530–42; fifth wife of Henry VIII. She was a daughter of Edmund Howard, third son of the duke of Norfolk. The king married her soon after the divorce of Anne of Cleves, in 1540. She was accused of adultery, and after a trial, in which her guilt seems to have been established beyond doubt, she was executed Feb. 13, 1542.

HOWARD, CHARLES, Lord Howard of Effingham, 1536–1624; b. England, son of lord William Howard, then lord high admiral, under whom he served with distinction. He succeeded his father in command just before the appearance of the Spanish armada, and it was mainly owing to his valor that the formidable enemy was defeated. In 1596 he commanded the expedition against Cadiz. In 1599, when England was again threatened by Spain, and Essex in Ireland appeared to encourage disaffection, Howard was made lieutenant of the kingdom, with full command of the army and navy. A few years later he resigned his office in favor of Villiers, duke of Buckingham.

HOWARD, JACOB MERRITT, LL.D., 1805–71; b. Vt., graduated at Williams college in 1830. He was for some time a teacher in an academy in Massachusetts. In 1833 he was admitted to the bar in Michigan, where he had settled. Five years later he was chosen to the legislature; in 1841 was a member of congress; and U.S. senator from 1862 to 1871. He is credited with having originated the name of the republican party, and is said to have written its first platform.

HOWARD, JOHN EAGER, 1752–1827; b. Md.; a soldier in the war of the revolution, and commanded a regiment at Germantown, where he did gallant service. At the battle of the Cowpens he saved the fortunes of the day by a brilliant bayonet charge, said to have been the first effective use of the bayonet by the patriots. He was voted a medal by congress for this service. He was severely wounded at Eutaw, and gained distinction in other battles. After the return of peace he was a member of congress, governor

of Maryland, and U. S. senator. When war with France was imminent Washington appointed him a brig.gen.

HOWARD, OLIVER OTIS, LL.D., b. Me., 1830; graduated at Bowdoin college in 1850, and at West Point in 1854, and entering the army was first engaged in field duty in the Florida Indian war. He returned to the academy, and was for a time assistant-professor of mathematics. In June, 1861, he was made col. of volunteers, and commanded a brigade at the battle of Bull Run. In the same year he rose to brig.gen.; continued in active service in the Virginia campaign, and lost an arm at the battle of Fair Oaks. In Nov., 1862, he was made maj.gen. of volunteers, and at Chancellorsville and Gettysburg commanded the second army corps. In 1863 he was in Tennessee, and participated in the battles of Lookout Mountain and Missionary Ridge. In 1864, he commanded the fourth corps in the army of the Cumberland, and in July was concerned in the engagements at Dalton, Resaca, and Kenesaw Mountain; he assisted in the siege of Atlanta, and in further operations under Sherman in the march to the sea. After the close of the war he was detailed to serve as commissioner of the Freedman's Bureau, and held that office until June, 1872. He was afterwards a special commissioner of Indian affairs, and from 1869 to 1873 president of Howard university. Since 1873 he has served on the Indian frontier. In Dec., 1868, he was made a brig.gen. in the regular army, and the next year brevet maj.gen. In 1881, by appointment of the president, he took command at West Point, including the military academy, relieving maj.gen. Schofield.

HOWARD UNIVERSITY, in Washington, D.C., was organized by act of congress in 1867, and named from gen. O. O. Howard, one of its most conspicuous founders, and its first president. It is intended for the higher education of negro students, but its laws make no formal distinction, in regard to color or sex, as to teachers or scholars. The university buildings are beautifully situated on very high ground 2 m. from the business center of the city, facing the university park. The principal building is of gray brick and is four stories high, containing recitation and lecture rooms, chapel, library, philosophical rooms, museum, and offices. The medical building is on the s. side of the park. Miner hall, set apart for ladies, will accommodate 140 students, and has rooms in connection with it for matron and teachers. Clark hall, for young men, accommodates 200 students. The general library contains about 7,000 volumes, many of them choice and select works. The professional departments have separate libraries. The mineral cabinet contains over 4,000 specimens, including fossils, minerals, etc. The museum contains a collection of coins, medals, and curiosities, specimens of valuable woods, Indian relics, portraits of distinguished men and women, views of the late war, engravings, and photographic views of classic ruins in Rome. The medical department has 7 professors and 3 lecturers; the theological department 3 professors and 1 lecturer, the classical, preparatory, and normal departments have 2 professors and 3 teachers; the law department 3 professors, and the collegiate department 3. The number of students in 1880 was 250. A majority of the medical students are white. The theological department is under the joint supervision of the presbytery of Washington and of the American missionary association (Congregational). The general management of the institution is vested in a board of 21 trustees. It has an income of \$8,500 per annum from interest and rent of buildings, and in 1880 was aided by congress to the amount of \$10,000. President, Rev. Wm. W. Patton, D.D.

HOWE, ELIAS, 1819-67; b. Mass.; brought up as a farmer and a miller, received his education in the common schools. In Lowell he first found employment in a manufactory of cotton machinery, and in Boston worked in an ordinary machine shop. Here he conceived the idea of the sewing-machine, which he perfected in May, 1845, and patented Sept. 10, 1846. It was not well received by the public, and the following year he went to England, where he was equally unsuccessful. After an absence of two years he returned in great poverty to find that others were profiting by his invention; but he continued working at the machine, devoting such means as he obtained to the prosecution of the people who had infringed upon his patent. His perseverance was at last crowned with success, and in 1854 his claim to priority of invention was legally established. Thenceforth his career was one of prosperity, and an income sometimes reaching nearly a quarter of a million of dollars per year repaid him for long effort and privation. Before the expiration of the patent in 1867 he had accumulated more than \$2,000,000. In the war of the rebellion Howe served as a common soldier in a Connecticut company, and on one occasion when the pay of the regiment was delayed he advanced the money himself.

HOWE, GEORGE AUGUSTUS, 1724-58; b. England, and came to America in command of a British regiment in July, 1757, at the close of which year he was made brig.gen. In July, 1758, he was killed in a skirmish with the French at lake George. A monument in Westminster abbey, paid for by the colony of Massachusetts, has been erected in his honor.

HOWE, JULIA WARD, b. N. Y., 1819; daughter of Samuel Ward, and widow of the late Dr. Samuel G. Howe, the Boston philanthropist, whom she married in 1843. Her education was the best afforded to girls of her time, and at an early age she gave evi-

dence of superior literary ability and taste; and after her marriage to Dr. Howe she became warmly interested in moral, social, and political subjects. She was an early champion of the equal rights of women, and has written and spoken extensively, in Europe and the United States, in advocacy of woman suffrage. She has also labored extensively in the cause of peace at home and abroad, with a view to the formation of a public sentiment in favor of settling international disputes by arbitration. She has often spoken in the pulpit upon religious themes. In Europe she is one of the best-known women of America. Her principal works, in addition to two volumes of travel and observation and numerous papers in magazines and journals, are: *Passion Flowers*; *Later Lyrics*; *Words for the Hour*; and two dramas, *The World's Own* and *Hippolytus*. Her *Battle Hymn of the Republic* was sung by union soldiers at thousands of camp-fires, as well as by popular assemblies all over the north, during the war of the rebellion.

HOWE, SIR WILLIAM, Viscount, 1729-1814; an English officer who served under Wolfe in the conflict on the heights of Abraham (Quebec), 1759. In the beginning of the American revolution he succeeded Gage as British commander-in-chief, and was in charge at the Bunker-hill fight. After the defeat of the Americans in the battle of Long Island and their retreat from New York, Howe took possession of the city, remaining there until succeeded by sir Henry Clinton, May, 1778. On the death of his brother Richard he succeeded to a baronetcy, and was a privy counselor at the time of his death.

HOWELL, a co. in s. Missouri, on the Arkansas border, drained by Spring river; 900 sq. m.; pop. '70, 4,218—24 colored. It has a hilly surface, and is to a large extent covered with forests. The soil is tolerably fertile. Chief productions: corn and pork. Co. seat, West Plains.

HOWELL, JOHN C., b. Philadelphia, 1819; entered the navy as a midshipman in 1836; rising to commander in 1862, and commodore in 1872. At the capture of fort Hatteras he was executive officer of the steam frigate *Minnesota*, and at fort Fisher he was in command of the *Nereus*. After the war he was placed in command of navy-yards, and in 1874 was appointed chief of the bureau of yards and docks.

HOWELLS, WILLIAM DEAN, b. Ohio, 1837; the son of a printer and himself brought up to that trade. He passed naturally to the editorial desk, and was a writer on the *Cincinnati Gazette* and the *Columbus State Journal*. In the mean time he became a contributor (chiefly of verse) to the *Atlantic Monthly*, and in unison with John J. Piatt he wrote *Poems of Two Friends*. President Lincoln sent Howells to Venice as consul, where he remained until the accession of Johnson to the executive chair. Soon after his return he became assistant editor of the *Atlantic Monthly*, and in 1871 was chosen sole editor, a position which he still retains. Some of his publications are *Venetian Life*; *Italian Journeys*; *No Lore Lost*; *Suburban Sketches*; *Their Wedding Journey*; *A Chance Acquaintance*; and *The Undiscovered Country*.

HOWSON, JOHN SAUL, D.D., b. England, 1816; graduated at Cambridge; in 1845 took holy orders, and afterwards became senior classical master in Liverpool college. From 1849 to 1865 he was principal of that college. In 1867 he became dean of Chester. He is best known from his *Life and Epistles of St. Paul*, written in conjunction with Rev. W. J. Conybeare. He has also written *The Character of St. Paul* and *The Metaphors of St. Paul*.

HÖXTER, a t. in Westphalia, on the Weser, 30 m. by rail e.n.e. of Paderborn; pop. 5,041. It is a prosperous manufacturing town, paper, linen, and cotton goods being the chief productions.

HOYLE, EDMUND, 1672-1769; b. England; a writer on card-playing, and afterwards on games in general. His first book was published about 1744, and has been by himself and others expounded and elaborated in almost innumerable editions down to the present time. He is a great authority upon whist, and reference to him has become proverbial. To be "according to Hoyle" is to be altogether right.

HUACA. See GUACA.

HUANCARELICA, a department in the interior of Peru, s.e. of the department of Lima; 10,814 sq. m.; pop. '76, 104,140. It is a mountainous, cold, and unfruitful region. There is some gold and considerable silver and copper, but the main production is quicksilver from mines discovered in 1563. Among the exports are the wools of sheep and llamas.

HUANUCO, a department in Peru, n. of the department of Lima; pop. '76, 77,988. The surface is rugged, the climate salubrious, and the soil fertile and well cultivated. Sugar and coffee are among the products, and there are large herds of sheep and cattle. This region is noted for ruins of ancient Indian civilization.

HUBBARD, JOSEPH STILLMAN, 1823-63; b. Conn.; graduated at Yale, and in 1844 was assistant to Sears C. Walker, astronomer in Philadelphia high-school observatory. In 1845 he was professor of mathematics, and assigned to the naval observatory at Washington, where he won a good reputation for scientific work.

HUBBARD, WILLIAM, 1621-1704; b. England; emigrated to Massachusetts, and graduated at Harvard in 1642. He was ordained in 1658, and was nearly all his life a

minister at Ipswich. In 1688 he was president of Harvard. As an author he is known by *A Narrative of the Troubles with the Indians*, in which appears the first map known to have been made in America, and a *Memoir of General Denison*. He left in manuscript a history of New England, published in 1815 by the Massachusetts historical society.

HUBBARDTON, a t. in Rutland co., Vt., 50 m. from Montpelier, mentioned in history as the scene of a sharp conflict on July 7, 1777, between the rear-guard of gen. St. Clair's army, retiring from the evacuation of fort Ticonderoga, and a considerable British force under generals Fraser and Riedesel. The Americans, under col. Warner, were driven from the town, but the British lost severely in killed and wounded.

HUBER, JOHANN NEPOMUK, b. Germany, 1830; graduated at Munich university, in which institution he became professor in 1859. He was a firm opponent of Jesuitism, and had much to do with organizing and strengthening the Old Catholic movement in Germany from and after 1871. He has been a voluminous writer in favor of free discussion of theological questions and against certain Roman Catholic dogmas, notably that of papal infallibility.

HUBER, PIERRE, 1777-1840; b. Switzerland; eminent as an entomologist, devoting his attention especially to bees, ants, and butterflies. His most important work is *The History and Nature of Ants*. He afforded great assistance to his blind father, François Huber; and, in turn, gained much of his own knowledge from the deep investigations of the latter.

HUBMEYER, or HUBMAIER, BALTHAZAR, 1480-1528; b. Germany; one of the leaders of the Anabaptist party; a professor of theology and a preacher. He was persecuted for his reformation doctrines, and fled to Moravia, where he organized an Anabaptist congregation. He was burned at the stake, March 10, 1528.

HUDSON, called also the NORTH RIVER, "the Rhine of America," one of the most important and beautiful streams of the United States. It rises in the Adirondack mountain region, and runs almost due s. from the neighborhood of lake George to New York bay, a course of nearly 200 miles. Down as far as Troy it is broken by falls and rapids, but thenceforth to the sea it is a tidal stream varying from a quarter of a mile to a mile in width, and with the exception of the shallows a short distance below Albany, in every part navigable for steamboats and light-draught sailing-vessels. It has been improved on the shallow part, and there is now no obstruction as far up as Troy, 151 m. above New York. The scenery of this river is especially fine. Sailing n. from New York city one passes on the e. side the heights of Fort Washington and the village of Inwood on the upper part of Manhattan island; Spuyten Duyvel creek, connecting with the Harlem river and so separating Manhattan from the mainland; then the village of Riverdale, near which are the buildings of Mt. St. Vincent, the mother-house of the sisters of charity, the central building being a granite castle originally erected for his own dwelling by Edwin Forrest, the actor; the suburban city of Yonkers, one of the most beautiful of towns both naturally and in its elegant residences; and the villages of Hastings and Dobbs's Ferry. On the w. side the palisades extend, an unbroken wall of rock from 250 to 600 ft. high, from Hoboken, opposite New York, to Piermont, nearly opposite Dobbs's Ferry. At this point, 20 m. from New York, the river spreads out into the Tappan Zee, $3\frac{1}{2}$ m. wide and 10 m. long. On the e. shore are Irvington, just n. of which is Sunnyside, the home of Washington Irving; Tarrytown, with Sleepy Hollow close by; and Sing Sing, a beautiful village, with the state penitentiary conspicuous from the river. All along this part of the river-bank are palatial residences with park-like grounds. On the w. side the palisades fall back into sloping hills some miles distant from the river, and give place for the villages of Piermont and Nyack and their adjoining farms. Above Nyack the mountains again come out to the river, and on the e. side Croton point, projecting from near the village of Cortland, bounds Tappan Zee on the n. and separates it from Haverstraw bay, named after the village which is the great brick manufactory of the country. Haverstraw bay in turn ends northward with the narrow pass between Stony Point on the w. and Verplanck's Point on the east. The highlands now loom up boldly in front, and after we pass Peekskill, on the right, the river narrows again and winds between Anthony's Nose on the e. and Dunderberg and forts Clinton and Montgomery on the west. Bending our course to the n.e. and then to the n.w., we pass around West Point, the picturesque seat of the U. S. military academy, then by Cornwall, also on the w. bank, and the river widening into the bay named from Newburg, a beautiful city rising from the w. bank, while 15 m. above, on the e. bank, is the city of Poughkeepsie. The course of the river now is more directly n. and s., and we pass on the e. the villages of Rhinebeck, Barrytown, and Tivoli, and on the w. Rondout and Kingston, since 1872 united in one city, the villages of Saugerties and Malden, and Catskill, with the mountains of that name towering just inland. A little farther up, on the e. side, is the city of Hudson, and above Hudson the villages of Stuyvesant, Castleton, and Greenbush, and on the w. side Athens, Coxsackie, New Baltimore, Coeymans, Overslaugh, and the city of Albany. Here the river is crossed by the first bridge, that of the New York Central railroad. A few miles above, the Mohawk river, the largest branch, enters from the w., and close by it the Erie canal,

while on the e. side stands the city of Troy. The upper river flows through a picturesque country, and along its banks are a number of handsome towns and villages, among the most important being Lansingburg, Waterford, Fort Edward, and Glens Falls. The Hudson river was seen by Verrazano in 1525, but was not explored until the arrival of Henry Hudson in Sept., 1609. He went up nearly to the present site of Albany, and named the stream "the river of the mountains." It was afterwards called Mauritius, after prince Maurice of Nassau, and finally the Hudson or, geographically, the North river, the Delaware being the South river. Its Indian name was Shatemuc. It was on the Hudson river that Robert Fulton made his first successful experiments in steam navigation.

HUDSON, a co. in n.e. New Jersey, between the Hudson and Passaic rivers, crossed by the New York, Lake Erie, and Western, the Morris and Essex, and the New Jersey Northern railroad; 75 sq. m.; pop. '70, 129,027; in '80, 187,950. The surface is generally rough, the eastern limit being bounded by the palisades, on the Hudson river, and the soil is tolerably fertile. The chief productions are garden vegetables for city market. Co. seat, Jersey City.

HUDSON (*ante*), a city in Columbia co., N. Y., on the Hudson river and the New York Central railroad, 28 m. s. of Albany, at the terminus of a railroad to Boston; pop. '75, 8,615. It is one of the oldest cities in the state, having been incorporated in 1785. Among its public buildings are a court-house, city-hall, more than a dozen churches, an academy, a public library, and a number of manufactories, furnaces, and foundries.

HUDSON, a village in Summit co., Ohio, at the junction of the Cleveland and Pittsburgh with the Cleveland, Columbus, and Mt. Vernon railroads, 25 m. s.e. of Cleveland; pop. 1800. It is the seat of Western Reserve college, organized in 1827.

HUDSON, FREDERIC, 1819-75; b. Mass.; for more than 30 years connected with *New York Herald* as principal or managing editor under Mr. Bennett. Hudson wrote an elaborate *History of American Journalism*, a careful and instructive compilation of the rise and progress of the press in the United States. He met his death at Concord, Mass., by being run over by a train of cars while driving.

HUDSON, HENRY NORMAN, b. Vt., 1814; graduated at Middlebury college, and was a teacher in Kentucky and Alabama. He devoted much of his time to the study of Shakespeare, and in 1848 published two volumes of lectures on the plays of the great author. About 1844 he joined the Protestant Episcopal church, and in 1849 took priestly orders in New York city. From 1350 to 1857 he issued an elaborate Shakespearean commentary in 11 vols., and in 1860-61 lectured on the same themes. In the war of the rebellion he was chaplain in the union army, and has since been engaged in editorial work. Besides his works on Shakespeare he has published *A Chaplain's Campaign with General Butler*, *Sermons*, etc.

HUDSON'S STRAIT. See HUDSON'S BAY, *ante*.

HUELVA, a province in s.w. Spain, bordering on Portugal and the ocean; 4,118 sq. m.; pop. '70, 196,469. It is a mountainous region, thickly peopled but not much cultivated. There are mines of iron, copper, lead, and coal, with several springs and salt works. The capital is Huelva.

HUERFANO, a co. in s. Colorado, traversed by the Denver and Rio Grande railroad; 1500 sq. m.; pop. '80, 4,124. The surface is rough and in some parts mountainous, with a good share of pasture-land. Stock-raising is the main employment. Co. seat, Walsenburg.

HUET, FRANÇOIS, 1814-69; b. France; a professor in the university of Ghent, and one of the forerunners of the Old Catholic movement. He was opposed to the absolutism of the pope, and undertook to establish Neocatholicism, which was very much like the system afterwards advocated by Dollinger and Hyacinthe. He published *Cartesianism, or True Renovation of Science; The Social Reign of Christianity; Essays on Catholic Reform*, etc.

HUGER, BENJAMIN, b. S. C., 1805; a graduate of West Point, serving in the Mexican war, and present at the surrender of Mexico. He was brevetted maj., lieut. col., and col. for gallant conduct. In 1861 he went with the rebellion and was made a maj. gen. in the confederate army. At the close of the war he settled in Virginia and engaged in farming.

HUGER, FRANCIS KINLOCK, 1764-1855; b. S. C.; son of Benjamin Huger, a revolutionary officer. He studied medicine under Dr. John Hunter and in Philadelphia, but is best known for joining in an attempt to take the marquis de Lafayette from his prison in Olmutz. He was arrested, and for eight months kept a prisoner. In 1798 he returned to America, and served in the second war with England in 1812. He was also in the South Carolina legislature.

HUGER, ISAAC, 1742-97; b. S. C.; one of five brothers who took the side of the colonies in the revolution. He was engaged in a number of battles and skirmishes, among which were the sieges of Savannah and of Charleston and the battle of Guilford court-house.

HUGGINS, WILLIAM, LL.D., b. London, 1824; an astronomer. In 1855 he built an observatory at his residence, in which he mounted a telescope of 8 in. aperture, and made some careful drawings of Mars, Jupiter, and Saturn. His attention was first engaged in observations on double stars, but afterwards he devoted himself to the spectrum analysis and the study of nebulae and comets. With Dr. Miller he compared the spectra of about fifty stars directly in the instrument with the spectra of several terrestrial elements. They concluded that the stars are hot bodies, similarly constituted to our sun, and that they contain many of the substances found on the earth. One of the most remarkable of Mr. Huggins's subsequent discoveries was that of the nature of some of the nebulae. He found that some of the bodies gave a spectrum of a few bright lines only, which showed that the light had emanated from heated matter in the state of gas; and further that one of the principal constituents of the gaseous nebulae is hydrogen. He concluded, therefore, that the nebulae are not clusters of stars too distant to be separately distinguished. He has since continued his prismatic researches by a re-examination of the nebulae by a more powerful spectroscope, by which his former results have been confirmed. He has also examined the spectra of four comets, and has found that the greater part of the light of these objects is different from solar light. The spectrum of Winnecke's comet he found to be identical with the spectrum of carbon. His observations of the bright comet of the autumn of 1874 confirm his earlier ones, and show that carbon, probably with hydrogen, forms one of the constituents of cometary matter. Mr. Huggins has also shown that the proper motion of the stars in the line of sight can be determined from any small shift of position which the lines of their spectra may have suffered, and that Sirius is moving from the earth with a velocity of 27 m. per second. Of 30 stars examined, subsequently 19 were found to be receding and 11 approaching. He has made observations of the spectra of the solar prominences, and devised the method by which the forms of these objects may be seen. He has also succeeded in detecting the heat received at the earth from some of the fixed stars. On the occasion of the meeting of the British association at Edinburgh, in 1871, he was created honorary LL.D. of that university. He was president of the royal astronomical society of Great Britain, 1876-78.

HUGH CAPET. See **CAPETIAN DYNASTY**, *ante*.

HUGHES, BALL, 1804-68; b. England; became a sculptor, studying seven years with E. H. Bailey, and becoming a successful competitor for the prizes of the royal academy. In 1829 he came to New York and made a fine bust of Alexander Hamilton, which was placed in the old Merchants' exchange, but was destroyed in the great fire of 1835. There is a work of his now in Trinity church, an alto-rilievo of bishop Hobart, and there are some of his works in Boston. He also made the bronze statue of Nathaniel Bowditch, in Mt. Auburn cemetery, near Boston.

HUGHES, JOHN, D.D., 1797-1864; b. Ireland; came to the United States at the age of 20, and was educated at Mount St. Mary's (Roman Catholic) college, Emmettsburg, Md. In 1825 he became a priest, and had pastoral charge in Philadelphia, where he established *The Catholic Herald*. In 1842 he became bishop of New York. This was about the time of the "Native American" political excitement, and he became an ardent opponent of that movement, especially so far as it meant to prohibit the appropriation of public money to the schools of the Roman Catholic church. In 1850 he was made archbishop, and his personal power and character had much to do with the growth of the church in the United States. He was the founder of St. John's college, and Aug. 5, 1855, he laid the corner-stone of St. Patrick's cathedral in New York city, the finest church edifice in the country. Soon after the beginning of the rebellion he went abroad, at the request of president Lincoln, to secure the friendly offices of foreign courts, particularly that of France; and in 1863 he publicly addressed the draft-rioters in New York, dissuading them from violence.

HUGHS, a co. in s. central Dakotah, on the Missouri river, formed after the census of 1870.

HULIN, or HULLIN. PIERRE AUGUSTIN, 1758-1841; b. Paris; entered the French army at 13 years of age, and was a sergeant at the opening of the revolution. He was on the side of the people, and was distinguished for bravery and humanity at the taking of the Bastille. He was imprisoned during Robespierre's rule, but released on the death of the tyrant. Thenceforward he was an officer under Bonaparte, and in 1807 became general of division. He was president of the court that condemned the duke d'Enghien to death, a circumstance that he deemed necessary, many years afterwards, to explain in an elaborate work.

HULL, HOPE, 1763-1818; b. Md., the son of an Englishman. He removed to Georgia near the close of the century, and was one of the chief founders of the Methodist denomination in that state.

HULL, ISAAC, 1775-1843; b. Conn. In early life he was a seaman in the merchant service. He was made a lieutenant in the U. S. navy in 1798, and in 1800 was first lieutenant on the frigate *Constitution*. He served with credit in the war with Tripoli, and became a captain in 1806. His greatest fame was won in the second war with Great Britain in the capture of the British frigate *Guerrière* by the U. S. frigate *Constitution* under

his command. This was the first and the most famous naval victory of the war. After peace Hull commanded the U. S. squadrons in the Pacific and the Mediterranean, and was one of the board of naval commissioners.

HULL, WILLIAM, 1753-1825; b. Conn., graduated at Yale, and practiced law. In the revolutionary army he served with some note, being in the battles of White Plains, Trenton, Stillwater, Princeton, Saratoga, and Monmouth. For his bravery in one instance he was thanked by congress. He became a member of the Massachusetts state senate. In 1805 Jefferson appointed him governor of Michigan territory, and in 1812 he was put in command of the army of the north-west. Under a combination of unfavorable circumstances he surrendered Detroit to the British. For this he was court-martialed and sentenced to death, but was reprieved by Madison in consideration of his age and former good services. Ten years afterwards he published an elaborate defense of his act. Later writers have fully vindicated his reputation.

HULLAH, JOHN, b. England, 1812; a teacher of music, coming first before the public in the score for Dickens's *Village Coquettes*. He has been professor of vocal music and harmony in King's college, and several other institutions, and conductor of the orchestra and chorus in the royal academy of music. In 1872 he was appointed musical instructor for the United Kingdom. Among his works are a *Grammar of Harmony*; a *Grammar of Counterpoint*; a *History of Modern Music*; and *The Transition Period of Musical History*.

HUMANITIES, from the Latin *humanitas*, denoting refinement of taste, mental culture; called also *humanity studies*, and include grammar, rhetoric, poetry, Greek and Latin, in distinction from natural and mathematical sciences.

HUMBERT IV., b. 1844; King of Italy, eldest son of Victor Emmanuel. At an early age he obtained an insight into political and military life under the guidance of his father, whom he attended during the war of Italian independence, although he was then too young to take an active part in the struggle. The youthful heir to the throne was more closely connected with the movement for the unification of Italy, which followed the events of 1859. In particular he took part in the work of reorganizing the ancient kingdom of the two Sicilies, and in July, 1862, he visited Naples and Palermo, where he shared the popularity of Garibaldi. When the war between Prussia and Austria was imminent, prince Humbert was dispatched to Paris to ascertain the sentiments of the French government in reference to the alliance between Italy and Prussia. On the outbreak of hostilities he hastened to take the field; obtained the command of a division of gen. Cialdini's army with the title of lieutenant; and took a gallant part in the disastrous battle of Custoza, June 23, 1866. On April 22, 1868, he married, at Turin, his cousin, the princess Marguerite Marie Thérèse Jeanne of Savoy, daughter of the duke Ferdinand of Genoa, brother of king Victor Emmanuel. This union resulted in the birth of a son at Naples, Nov. 11, 1869, who received the names of Victor Emmanuel Ferdinand Mary Januarius, and the title of prince of Naples. After the seizure of Rome by the Italian troops in 1870, prince Humbert took up his residence there. He succeeded to the throne on the death of his father, Jan. 9, 1878. As he was entering Naples, Nov. 17, 1878, a man named Giovanni Passanante approached his carriage and attempted to assassinate him with a poniard, but the king escaped with a slight scratch. Signor Cairoli, however, the prime-minister, who was with him, was seriously wounded.

HUMBOLDT, a co. in n.w. California, bordering on the ocean, and intersected by Mad and Eel rivers; 2,800 sq.m.; pop. '70, 6,140. It is mountainous, with fertile valleys and rolling prairie, and is in a large degree covered with timber. Lumber is the main article of export. The immense red-wood trees are a feature of the region. Co. seat, Eureka.

HUMBOLDT, a co. in n.w. Iowa, on the forks of Des Moines river; 432 sq.m.; pop. '70, 2,596. The surface is mostly level and the soil fertile; chief productions: corn, hay, and oats. Co. seat, Dakota.

HUMBOLDT, a co. in n.w. Nevada, on the Oregon border; intersected by Humboldt river; 19,000 sq.m.; pop. '75, 2,437. The surface is mountainous and unfruitful; water and timber are scarce. Copper, lead, and silver are found. Co. seat, Winnemucca.

HUMERUS, the largest and longest bone of the upper extremity. It is the one bone of the arm proper, that is, that portion between the shoulder and elbow. It is divided anatomically into a *shaft* and two *extremities*. The upper extremity is rather the largest, and has a semi-globular head which is received (partially, because the cavity is shallow) into the *glenoid* cavity of the scapula or shoulder blade, forming what is called a ball and socket joint. Two processes or projections of the shoulder blade assist the glenoid cavity in completing the cavity or seat of the head of the humerus. There are three ligaments which hold the humerus to the scapula: the capsular, the coraco-humeral, and the glenoid, the relations being somewhat similar to what obtain in the hip joint (q.v.). The shaft of the humerus is nearly cylindrical in its upper part, but triangularly prismatic below, becoming flattened and broad at the lower extremity, where are placed the two condyles, with their articular surfaces, and the trochlea between them, which form, with the two bones of the fore-arm, the elbow joint (see ARM and SKELETON). The

broad, flat lower extremity has two depressions on the anterior aspect of the bone: one slight one on the outer side called the radial depression, which is for the reception of the anterior border of the head of the radius, when the arm is strongly flexed; the other, called the coronoid depression, for the reception of the coronoid process of the ulna during flexion of the arm. Opposite these depressions, on the posterior surface of the bone, is a deep triangular depression, called the olecranon fossa, for the reception of the important process of the ulna, called the olecranon process. The humerus forms with the scapula, as above-mentioned, a ball and socket joint, the shoulder joint (q.v.). The elbow joint is a hinge joint, and, to a certain extent, in its relation to the head of the radius, a ball and socket joint, and is one of the most beautiful pieces of mechanism which can be conceived, especially in man, where it exhibits indications of design having reference to man's intellectual functions.

HUMILIATI, a monastic order founded in 1134 by several Italian noblemen who had been sent as prisoners to Germany by Lothar II., and were released on account of their *humility*. In 1151 they were embraced under the rule of St. Benedict, and the order was confirmed by Innocent III. half a century later. They ultimately spread so widely as to have 98 houses under the jurisdiction of their order; but they were suppressed by Pius V. in 1576 on account of their luxury and cruelty. A female order of Benedictines, known as humiliate nuns, or nuns of Blassoni, from their foundress, served as nurses, etc. In 1571 they were suppressed by the pope on account of some disorders, but a few convents, greatly decayed, still exist in Italy.

HUMBACK WHALE, one of the *balaenidae*, or toothless whales, which includes the right or Greenland whale, the teeth being replaced by whalebone plates, whence they are also called *whalebone whales*. The humpback whale belongs to the genus *megaptera*. They have a hump on the back which is an adipose dorsal fin. They are very ferocious, and valued for their oil. See **WHALE**.

HUMPHREY, EDWARD PORTER, D.D., LL.D.; b. Conn., 1808; son of Heman; graduated at Amherst in 1828. He has been a Presbyterian pastor in Indiana and Kentucky; and professor of ecclesiastical history in Danville theological seminary.

HUMPHREY, HEMAN, D.D., 1779-1861; b. Conn.; graduated at Yale, and was pastor of a Congregational church in Fairfield for ten years; afterwards pastor in Pittsfield, Mass. In 1823 he was chosen president of Amherst college, over which he presided until 1845, after which he turned his attention to authorship. He was an early advocate of temperance, and a report of his on the subject made in 1813 is said to have been the first temperance tract. Among his publications there are, besides biographies, *The Sabbath*; *Tour in France, Great Britain and Belgium*; *Domestic Education*; and *Revival Sketches*.

HUMPHREY, ZEPHANIAH MOORE, D.D., b. Mass., 1824; graduated at Amherst and in theology at Andover in 1849. He has had pastoral charge in Milwaukee, Chicago, and Philadelphia; he was a leading member of the last general assembly of the new school branch of the Presbyterian church, his brother being at the same time a prominent member of the old school assembly, and took an influential part in the consummation of the reunion of the two branches; and in 1871 he was moderator of the reunited assembly. In 1875 he became professor of church history in Lane theological seminary, at Cincinnati, Ohio.

HUMPHREYS, a co. in middle Tennessee crossed by the Nashville, Chattanooga, and St. Louis railroad, bounded w. by the Tennessee river; 400 sq.m.; pop. '70, 9,326-1295 colored. It has a hilly surface largely covered with forests. Corn is the chief crop. Iron is found. Co. seat, Waverly.

HUMPHREYS, ANDREW ATKINSON, b. Philadelphia, 1810; graduated at West Point and served in the U. S. army until 1836. He then resigned from the army, but in 1838 rejoined it and was assigned to the topographical department, with the direction of the coast survey office. He was also engaged in the Pacific railroad survey. In the war of the rebellion he was on McClellan's staff, and afterwards was Meade's chief of staff. He saw much active service at Fredericksburg, Chancellorsville, and Gettysburg. In 1866 he was appointed chief of engineers of the U. S. army with the rank of brig.gen.

HUMPHREYS, DAVID, LL.D., 1752-1818; b. Conn.; graduated at Yale; a captain in the revolutionary war, and aid to Washington. In 1784 he went to France with Jefferson as secretary of legation; afterwards to Lisbon, and in 1797 to Spain as ambassador. In the war of 1812 he was an officer of militia. He was one of the writers of the *Anarchiad*, a satirical work in verse published soon after the revolution. He also wrote a life of Putnam.

HUMUYA, a river in Honduras, which with the Santiago and Blanco forms the Ulua. The Humuya has a course of 100 m.; is rapid and navigable only for canoes. It passes by the city of Comayagua, the capital of Honduras, and its chief interest exists in its possible connection with an interoceanic canal.

HUNFALVY, JÁNOS, b. Hungary, 1820; professor of statistics in the academy at Kásmark; took part in the revolution of 1848; and five years later became professor of

history in the polytechnic school at Buda. He has published *Universal History; Physical Geography of Hungary; Hungary and Transylvania* and some other books.

HUNFALVY, PÁL, b. Hungary, 1810; a member of the diet, professor of jurisprudence in the academy at Kásmark, and a philologist. He has written works upon languages, particularly concerning the origin of the Hungarian tongue.

HUNGARIAN GRASS, a hardy annual, a variety of millet. It grows luxuriantly in almost any soil, and is highly esteemed for forage, being greatly relished by horses and cattle.

HUNGARIAN LANGUAGE AND LITERATURE (HUNGARY, *ante*). The origin of the language is involved in obscurity, but its vitality is remarkable. It was no doubt spoken and written by some of the tribes in middle Asia at a very early period. It is now accommodated to the Latin alphabet, and consists of 26 simple and 6 compound sounds. Whatever changes it has undergone, it yet retains all its essential features. It indeed embodies many foreign words, but it has assimilated them in accordance with its own fundamental laws. Its system of suffixes gives it great plasticity, enabling it to meet in the readiest way difficulties that other languages can only overcome in a very awkward fashion. It is capable of expressing with ease and fidelity every shade of meaning conveyed in other tongues. The literature of Hungary is of comparatively recent date, its growth having been checked by the introduction of Latin as the language of priests and teachers as well as of the court under Stephen I., who introduced the Roman religion and reigned from 997 to 1038. The remnants of Hungarian writing from this time till the Protestant reformation are very scanty. This great movement promoted the cultivation of the native tongue, but the German element coming in with the Hapsburgs offered a new check to the development of the national literature. In the 16th c., parts of the Bible were translated into Magyar, and distinguished orators and poets made the language the vehicle of their appeals to the national feeling. In the 17th c. the entire Bible was translated into Magyar, the Hungarian muse found new votaries, and eminent orators arose to stir the hearts of the people by addressing them in their native tongue. But the influence of the German dynasty arrested the national movement, and Latin again predominated. Near the close of the last c. there was a reaction, and societies for the cultivation of the Magyar tongue were formed, and various periodicals founded in the same interest. The new movement, identical as it was with the regeneration of the nation, was successful; and within the first 25 years of the present c. all foreign elements gave way before it. The credit of this is largely due to Francis Kazinczy, the great linguistic reformer, and the poets Csokonai, Dayka, Verseghy, Alexander, and Virág. The golden age of Hungarian literature was the 30 years preceding the revolution of 1848-49. Charles Kisfaludy, brother of Alexander, created the Hungarian drama by his tragedies and comedies. Kölcsey by his lyrical poems, ballads, prose writings, and orations, exerted a potent influence upon the patriotism of the nation, Fay's fables, and Czuczor's and Vörösmarty's popular epics also did much to evoke and foster a true national feeling. Bajza was not only an eminent lyrical poet, but a historical writer and aesthetical critic. Jósika and Eötvös, eminent in the field of historical fiction, exercised a large influence. Belenyei, Császár, Bartholomew Szemere, and others wrote books of travel. As political writers Szechenyi, Kossuth, Eötvös, and others took high rank; while in the field of history Horváth, Péczely, Jászay, and Bajza did excellent work. Szontágh, Márki, Gregus, and others wrote historical treatises; while the natural sciences, theology, languages, and antiquities did not lack for exponents. The revolution of 1848-49 doomed many gifted writers to the dungeon, the scaffold, or exile, and the literature of the last 30 years is not on the whole equal to that of the preceding period. The restoration of the Hungarian constitution has, however, brightened the literary prospects of the country.

HUNGARIAN WINES (HUNGARY, *ante*). See GERMAN WINES.

HUNT, a co. in n.e. Texas, on Sabine river; 850 sq.m.; pop. '80, 17,229—1214 colored. The surface is hilly and well wooded; chief productions: cotton, corn, and pork. Co. seat, Greenville.

HUNT, HELEN. See JACKSON, HELEN HUNT.

HUNT, HENRY, 1773-1835; b. England; a friend of Cobbett, Horne Tooke, and similar reformers; presided over a reform meeting in Manchester in 1819, on which occasion the military interfered and many persons were killed. Hunt was imprisoned, and on his release nearly three years afterwards, became a hero-martyr, made showy parades, and in 1830 was elected to parliament, defeating the earl of Derby. He devoted much of his life to forwarding the interests of the reform bill, whose passage he was fortunate enough to witness.

HUNT, HENRY JACKSON, b. Mich., 1819; graduated at West Point; served in the war with Mexico in many actions, and until its conclusion. In the war of the rebellion he was on McClellan's staff, was commander-in-chief of the artillery of the army of the Potomac, and at the end of the war held the rank of maj.gen. of volunteers. He has published papers on artillery, on projectiles, on army organization, etc., and was made president of the permanent artillery board of the army.

HUNT, JOHN, b. England, 1812; a Wesleyan missionary in the Fiji islands, where he labored many years. He translated the New Testament into the native tongue.

HUNT, RICHARD MORRIS, b. Vt., 1828; chose the profession of architect, and in 1843 went to Europe, and studied in Paris, Greece, Asia, and Egypt. In Paris he was employed on the work connecting the Tuileries with the Louvre. In 1855 he returned to his own country, and has been the architect of the capitol extension at Washington, the Lenox library and the *Tribune* building, New York, and other important structures.

HUNT, THOMAS STERRY, LL.D., PH.D.; b. Conn., 1825. In 1845 he became assistant to prof. Silliman in his chemical laboratory at Yale college, and in 1847 was appointed chemist and mineralogist to the geographical survey of Canada. He held this post for more than twenty-five years, resigning in 1872 to accept the chair of geology in the Massachusetts institute of technology. His earlier studies were directed especially to theoretical chemistry, developing a theory essentially his own, in which all chemical compounds are deduced from simple types represented by one or more molecules of water or of hydrogen. These views are maintained by him in a series of papers in the *American Journal of Science*, beginning in 1848. His researches into the chemical and mineral composition of rocks have probably been exceedingly thorough; while his investigations of the chemistry of mineral waters have led him to form a theory of their origin and formation, and their relations to the origin of rock masses, both crystalline and uncrystalline, and to lay the basis for a system of chemical geology. He has discussed the phenomena of volcanoes and igneous rocks, and has revived the theory that the source of these is to be sought in the chemical reaction set up in the sedimentary deposits of the crust of the earth, through the agency of internal heat; and has sought to harmonize the facts of dynamical geology with the notion of a solid globe, in opposition to that which holds to a globe with a liquid interior. His views on these and other kindred questions, are to be found in an essay on the *Chemistry of the Earth*, in the report of the Smithsonian institution for 1869, in his address as retiring president of the American association for the advancement of science, and in more recent papers. His contributions to American and European scientific societies and journals are very numerous; and a collection of many of them was published in 1874. He furnished many important articles in his specialty to Appleton's *American Cyclopædia*, and is a member of the leading societies of both continents. He has reported fully on the auriferous quartz belt of Nova Scotia.

HUNT, THORNTON, 1810-73, b. England; an art critic, son of Leigh Hunt; was educated as a painter, but preferred the profession of a writer, and took charge of the political department of the *Constitutional* as long as it existed, and was afterwards associated with the London *Spectator* (1840-60). He edited Leigh Hunt's autobiography, and was the author of a romance entitled *The Foster Brother*.

HUNT, WARD, LL.D., b. N. Y., 1810; graduated from Union college in 1828. In 1839 he was elected to the state assembly; in 1844 was chosen mayor of Utica, and in 1865 was elected judge of the court of appeals. In 1870 he was commissioner of appeals, and in 1873 was appointed a judge of the U. S. supreme court.

HUNT, WILLIAM MORRIS, 1824-79, b. Vt.; an artist, and one of the first to introduce the characteristics of the French school into the United States. He was a pupil of Couture in Paris in 1848. Among his productions are "The Lost Kid," "The Choristers," "Girl at the Fountain," "Marguerite," "Morning Star," "Bugle Call," etc. He also painted portraits of many celebrated persons, excelling in this department of art, but gaining his high reputation through his skill and originality in genre-painting.

HUNTER, DAVID, b. D. C., 1802; graduated at West Point in 1822. In the war of the rebellion he commanded a division at Bull Run, in which conflict he was wounded, and was at once promoted to maj. gen. of volunteers. While in command of the department of the south in 1863 he declared slavery abolished, but was overruled by president Lincoln. He was on the commission that tried the murderers of Lincoln, and in 1866 was placed on the retired list.

HUNTER, ROBERT MERCER TALIAFERRO, b. Va., 1809; educated at the state university, and began the practice of law. In 1837 he was a member of congress, and two years afterwards was chosen speaker of the house of representatives. In 1846 he was elected to the senate. When the rebellion began he went with the confederates and was for a brief time the secretary of state of the temporary confederate government. In 1865 he was one of the peace commissioners sent to confer with president Lincoln, but the conference amounted to nothing. His acts of treason were pardoned by Andrew Johnson in 1867.

HUNTERDON, a co. in w. New Jersey, on the Pennsylvania border, traversed by three railroads and bounded on the s.w. by the Delaware river; 500 sq. m.; pop. '80, 38,568. It has a hilly and in some parts a mountainous surface, and the soil is generally fertile. The chief products are corn, wheat, oats, hay, butter, and flax. Co. seat, Flemington.

HUNTER'S POINT. See LONG ISLAND CITY.

HUNTING. The manner of conducting field sports has varied considerably at different periods. Formerly the term hunting signified the pursuit and destruction of wild animals whose presence was dangerous, or whose flesh was calculated for food. Now the word is often applied to chasing animals with hounds for sport or exercise. Xenophon tells us in a treatise on dogs and hunting that the art originated with Apollo and Diana, and asserts that the chase forms the best soldiers in the world; that it habituates men to cold, heat, and fatigue; that it kindles courage, elevates the soul, and invigorates the body; that it retards the effects of age, and renders the senses more acute; and finally that the pleasure which it affords is a sovereign remedy against all mental uneasiness. Aristotle wrote a treatise on field sports by order of Alexander the great, and Polybius relates that Maximus restored discipline in the Roman legions by often exercising them in hunting. Oppian distinguished himself by his poems on hunting, and several of the finest similes of Homer are taken from hounds in chase. The Romans at one time discouraged hunting among the upper orders of society, fearing it might become a passion which would divert them from their essential duties. But, aware of its beneficial effects in forming the people for war, they substituted the cruel and degrading exhibitions of animals destroying each other in an amphitheater. Yet we find many of their emperors encouraging hunting, and some of their best writers, such as Virgil and Horace, extolling it. The ancient Germans and Gauls were excellent hunters, and the ancient Britons had that ardent passion for the chase which has always been characteristic of England. The Anglo-Norman and early English monarchs were devoted to the art, and a code of laws relating to it was formed by one of the Welsh princes in the 12th century. We hear of fox-hounds first in the time of Edward I., and during the reign of his successor hunting in England may be said to have been reduced to something like a science. Edward III. was a great stag-hunter, and even while he was engaged in war with France there were attached to his army 60 couples of stag-hounds and an equal number of hare-hounds. It does not appear that the fox was much in esteem for the chase by any of the Anglo-Norman sportsmen, and Somerville, in his famous poem, *The Chase*, does not treat him with the respect which he pays to the stag or the hare. Hunting, however, advanced steadily in all its branches, and flourished greatly during the last century owing to the encouragement given it by George III.

The higher kinds of game animals are now so scarce in the United States east of the Missouri river that sportsmen can have little real hunting until they cross the Rocky mountains. In the vast area lying between that chain and the Pacific ocean may be found nearly every species of game indigenous to the North American continent. Among the latter may be mentioned the grizzly and black bears, the mountain sheep and goat, several species of deer, the moose, cougars, wolves, foxes, and many smaller quadrupeds. Of the entire area Montana, Wyoming, Idaho, Oregon, and Washington Territory are by far the best hunting grounds, as they possess all the necessary elements of soil and climate, and their population is yet small. Sporting dogs of all kinds can be utilized in every quarter of the country, but the most valuable are pointers, setters, and hounds. The greyhound can be employed in coursing hares and antelopes; the deerhound for following on open ground the elk, the moose, and the white-tailed deer; the terrier for routing foxes and badgers from their burrows; the beagle, harrier, foxhound, and other hounds are useful in certain kinds of hunting. The weapons required for the chase, in the west, are a rifle, a breech-loading shotgun, a heavy revolver, and a good hunting knife.

The hunter can estimate the size of the animals which he is trailing, by the spread of the feet on the ground; their weight, by the depth of the impression made; the speed at which they move, by the intervals between the paces, and the length of time since they passed over a spot by the freshness of the tracks. If an animal be seriously wounded, it may be detected by drops of blood, or by the irregular and straddling gait. All game quadrupeds should be hunted up wind, seldom across it, and never down it, as scent is to them what sight is to birds and feeling to human beings.

Wolves are unusually numerous throughout the whole of N. W. America, and they are equally at home on the prairie or in the forests, on the mountains or on the treeless plateaus. The bison or American buffalo is now confined to a few regions extending from British America to New Mexico, but it is nowhere as abundant as formerly. The buffalo is hunted by two methods—stalking it, and running it down on horseback; and it is estimated that a quarter of a million bison are destroyed annually. Foxes are very numerous throughout the west, and fox-hunting as carried on in Europe was a favorite amusement with the southern planters before the rebellion. Fox-hunting clubs and packs of hounds have been lately established in New York and a few other places. The American antelope is found all over the open plains of the west. If the pleasures of antelope hunting were more generally known it would become what hare-coursing is in the British kingdom, and with this greater advantage that it affords much keener amusement, and gives hounds, horses, and hunters a better opportunity of testing their speed, power, mettle, and endurance. Hares are so abundant that they are considered nuisances in many sections of the country, and a good marksman can kill from twenty to fifty a day. In California the hare is hunted regularly with greyhounds. It is the only part of the United States where a coursing club

exists. This club is governed by the same rules as those of Great Britain, and its meets are accurately reported. The progeny of the victorious dogs command a high price. The hares are hunted in various ways. One method is to run them down out of cover with slow-hounds, and shoot them as they flee past a stand; another is to course them with greyhounds; and a third way is to trap or snare them. Among the smaller game which often afford pleasant sport are the raccoon, opossum, and squirrel families. The first two are hunted principally at night, as they are nocturnal in habits, and are generally killed in the leafy retreats of trees and shrubbery where they take refuge. To hunt wood-squirrels successfully small curs or terriers should be used. See FOX-HUNTING, *ante*.

HUNTINGDON, a co. in s. central Pennsylvania, on the Juniata river, intersected by the Pennsylvania railroad; 800 sq.m.; pop. '70, 31,251. The surface is mountainous and to a large extent covered with forest. The valleys are fertile, producing wheat, corn, etc. Co. seat, Huntingdon.

HUNTINGDON, the extreme s.w. co. of Quebec, Canada, on the Chateauguay river, the New York border, and the St. Lawrence, traversed by a branch of the Grand Trunk railroad; 400 sq.m.; pop. '71, 16,304. It has an undulating surface, and the soil is fertile. Chief town, Huntingdon.

HUNTINGTON, a co. in n.e. Indiana, crossed by the Toledo, Wabash, and Western railroad; 400 sq.m.; pop. '70, 19,036. Surface level and soil fertile. Productions: grain, wool, cattle, and lumber. Co. seat, Huntington.

HUNTINGTON, a city in Huntington co., Ind., on the Wabash and Erie canal and the Toledo, Wabash and Western railroad; 24 m. s.w. of Fort Wayne; pop. 2,925. The city has a dozen manufactories of wooden ware, two iron foundries, two newspapers, library, reading room, museum, etc. Lime-burning is a leading occupation.

HUNTINGTON, a village in Suffolk co., N. Y., reached by the Long Island railroad; pop. '80 (of township), 8,098. The manufacture of bricks is an important industry. The region is to a considerable extent peopled with wealthy residents of New York city.

HUNTINGTON, a t. of Cabell co., W. Va., on the Ohio river, 160 m. above Cincinnati, and 52 m. w. of Charleston; pop. '70, 2,650. It is just below the mouth of the Guyandotte river, and is the western terminus of the Chesapeake and Ohio railroad, and the eastern terminus of a line of steamers run in connection with the trains. It was organized as a city in 1871, and is a place of important manufactures. It is the seat of Marshall college, a state normal school, a bank, 2 newspaper offices, 9 churches, 3 hotels, a foundry, a planing mill, and the machine shops of the railroad.

HUNTINGTON, DANIEL, b. N. Y., 1816; educated at Hamilton college. Through an acquaintance with Elliot, the portrait painter, he was led towards art, and in 1835 began to study under professor Morse, and still later with Inman. In 1839 he visited Italy; returned the next year and began work, but was compelled to desist in consequence of failing eyesight. He was again in Europe in 1844, where he painted some noteworthy pictures. After his return he was engaged chiefly on portraits, but painted also a few historical pictures, among which are: "Henry VIII. and Catherine Parr," and "Mary Signing the Death Warrant of Lady Jane Grey." Thereafter he became a permanent resident of New York, and in the course of a few years painted the portraits of many notable people of the city and country. To the people at large he is best known by the engraving of his picture of "The Republican Court in the Time of Washington," in which there are more than 60 figures, of which nearly all are accurate portraits taken from original paintings. He was for many years president of the national Academy of Design.

HUNTINGTON, FREDERICK DAN, D.D., b. Mass., 1819; graduated at Amherst, and studied theology in Cambridge divinity school. In 1842 he was a Unitarian pastor in Boston, and in 1855 preacher to Harvard university. In 1860 he became an Episcopal minister, and in 1869 was chosen bishop of central New York. Some of his publications are *Human Society as Illustrating the Power, Wisdom, and Goodness of God; Lessons on the Parables of Our Savior, and Steps to a Living Faith*.

HUNTINGTON, JEDEDIAH VINCENT, 1815-62; b. New York, a brother of Daniel. After practicing medicine for several years he became a minister of the Protestant Episcopal church. In 1849 he went to Europe and then joined the Roman Catholic communion. In Baltimore he edited the *Metropolitan Magazine*, and in St. Louis, *The Leader*. He published some novels illustrating conversion to the Roman Catholic faith, among which are *Lady Alice, or the New Una; Alban; The Forest; Blonde and Brunette; and Rosemary*.

HUNTINGTON, SAMUEL, 1732-96; b. Conn.; a signer of the declaration of independence; educated to the law, and was associate justice of the superior court of Connecticut. He succeeded John Jay as president of congress, and in 1781 resumed his judicial position. In 1786 he was governor of Connecticut and was re-elected every year as long as he lived.

HUNTSVILLE (*ante*), sometimes called "the queen city of the mountains," one of the most important and prosperous of the towns of Alabama. It is high up on a spur of the Cumberland mountains, and is reached by a branch of the Memphis and Charleston railroad. There are a large number of manufactories in the place, a seminary, ten churches, and two newspapers.

HUNTSVILLE, the seat of justice of Walker co., Tex., on the Houston and Great Northern railroad, 200 m. s.e. of Austin; pop. '70, 1599. There are in the place a number of important manufactories. It is also the seat of the state prison, and the burial place of gen. Sam Houston.

HUPFELD, HERMANN, D.D., 1796-1866; b. Germany, and noted as a Hebrew scholar. He was professor at Marburg and Halle, and in 1843, on the death of Gesenius, took the professorship of oriental languages. His most important work is a commentary on the Psalms, which is considered the most thorough and masterly work of its class, and has been translated into English.

HURLBERT, STEPHEN AUGUSTUS, b. S. C., 1815; practiced law in Charleston and in Illinois. In the war of the rebellion he was a brig-gen. of volunteers, and was in the action at fort Donelson. He was afterwards in service at Shiloh, Corinth, Memphis, and Meridian. In 1869 he was minister of the United States to Colombia, and in 1873 he was elected a member of Congress.

HURLBERT, WILLIAM HENRY, b. S. C., 1827; graduated at Harvard 1847, and in divinity at Cambridge. After a visit to Europe he appeared in New York in literature as a writer for *Putnam's Monthly*. After some service on the editorial staff of the *New York Times* he became one of the editors of *The World*, and with some interruptions has remained connected with that newspaper for most of the time as the principal editor. As an author, outside of his journalistic career, he has given to the world *Gan-Eden, or Pictures of Cuba*, and *General McClellan and the Conduct of the War*. Mr. Hurlbert has traveled extensively in Europe, in Mexico, and in South America.

HURON, a co. in e. Michigan, lying between Saginaw bay on the n.w. and lake Huron on the n.e.; area 800 sq.m.; pop. '74, 11,964. Several streams flow through it; among them Pigeon river. The surface is generally level, and the soil good, being largely covered with forests. The chief productions are wheat, oats, hay, and potatoes. Co. seat, Bad Axe.

HURON, a co. in n. Ohio, on the Vermillion and Huron rivers, intersected by three railroads. 475 sq.m.; pop. '80, 31,609. The surface is mostly level, and much of it is covered with forests. Wheat, corn, oats, wool, and butter are the main products. Co. seat, Norwalk.

HURON, a co. in w. Ontario, Canada, on lake Huron, watered by Maitland river, and traversed by the Great Western railroad; 1288 sq.m.; pop. '70, 66,165. It is a lumbering and farming region, and in some places there are valuable salt springs. Chief town, Goderich.

HURON, LAKE (*ante*), one of the five great lakes on the n. frontier of the United States, lying between lake Superior on the n.w., lake Michigan on the w., and lake Erie on the s.e. It is the third in size of the great lakes, having an area of about 21,000 sq.m., and being about 250 m. long, and 190 m. wide. It receives the waters of lake Superior through the St. Mary's river, and those of lake Michigan through the straits of Mackinaw, and empties through the St. Clair river into lake Erie. It is bounded w. and s.w. by the southern peninsula of Michigan, and n. and e. by the province of Ontario, Canada. The general direction of the lake lengthwise is from n.n.w. to s.s.e., and it is divided into two parts by the Huron peninsula and a chain of islands, of which the Great Manitoulin is the largest, which inclose altogether within Canadian territory the vast Georgian bay, and Manitoulin bay. The larger portion of the lake is in the form of a crescent, with its hollow side towards Michigan, the Michigan shore being deeply indented by Saginaw and Thunder bays. The surface is 19 ft. above the level of lake Erie, 352 ft. above lake Ontario, and 578 ft. above the sea, with occasional fluctuations as in the other lakes. Its depth is very great, averaging from 800 ft. to 1000 ft., while off Saginaw bay it is said that soundings of 1800 ft., or 1200 ft. below the level of the Atlantic, have been made without finding bottom. The waters are very clear, pure, cold, and sweet, especially in the northern part, and abound in fish, of which the white-fish is the most important. There are few harbors on the w. side, but vessels find shelter in Saginaw bay, about 70 m. n. of the outlet, and also in Thunder bay, as much further north. Presque Isle is also a fair harbor, and there is good shelter under the s. side of the island of Mackinaw. A number of streams of no great importance empty into the lake. The lake is subject to violent storms, but navigation is safe from May 1 to Dec. 1. Mackinaw has long been an important post for fur trade with the Indians. Bay city, at the head of Saginaw bay, is an important lumber depot, and copper mines have been opened in the upper portions of Manitoulin bay. Excellent grindstones are cut from the sandstone near Thunder bay. It is said that not less than 3,000 islands break the surface of the lake.

HURON INDIANS. See **WYANDOTS**, *ante*.

HURREEANAH, a British district in Hindustan, in the division of Hissar, under the jurisdiction of the lieutenant-governor of the n.w. provinces; area, 3,300 sq. m.; with a comparatively scanty amount of population, consisting of Hindus and Mohammedans. The district is intersected by the canal originally constructed by Feroz Toghluq, the renowned king of Delhi. This watercourse having become nearly obliterated, was cleared out by order of the British government, and made available for the purpose of irrigation. Towards the close of the last century, George Thomas, an Irish adventurer, made a bold attempt to establish an independent principality in Hurreeanah under his own rule. He fortified the principal town, collected troops, cast cannon, and coined money bearing his own name; but being attacked by a superior native force under the command of the French adventurer Perron, he was overpowered and forced to retire. The principal towns are Hissar and Hansae.

HURST, JOHN FLETCHER, D.D., b. Md., 1834; graduated at Dickinson college; studied theology in Germany, and for 8 years after 1858 was a Methodist minister in New Jersey. In 1866 he returned to Germany and taught theology in the Martin mission institute in Bremen, and afterwards traveled in several European countries. In 1871 he was chosen professor of historical theology in the Drew theological seminary at Madison, N. J., and in 1873 was made president of the institution. Some of his works are *History of Rationalism*; *Outlines of Bible History*; *Life in the Fatherland*; *Lectures in Defense of St. John's Gospel*; and *History of the Church in the 18th and 19th Centuries*.

HUSBAND AND WIFE (*ante*).—A little more than thirty years ago the legal status of husband and wife in respect to each other and to society, in all or nearly all the states of the American union, was nearly the same with that in England. Under the common law, wives were often subjected to great hardship. Half a century ago the public attention was called by a few earnest people to the essential injustice of these long-established doctrines, the key to which is found in the maxim that the legal existence of the wife is merged in that of her husband. The agitation, though discomfited and ridiculed for a time, took fast hold upon the public conscience, and found expression in numerous signed petitions to the legislatures for a reform of the obnoxious laws. While the claim of the agitators that women should be permitted to vote and be made eligible to office was lightly regarded, conscientious legislators would not refuse to listen when wives and mothers besought them to redress odious and inhuman abuses. Women who had made a study of the subject were accorded a hearing before legislative committees. New York was the first state to respond to the demand for reform, but the example was followed by others in rapid succession, until now the common law doctrine that a wife's legal existence is merged in that of her husband is regarded with universal disfavor as a relic of barbarism. The laws of the states differ in some respects from each other, but as a general rule the real and personal property possessed by a woman at the time of her marriage, or which she may acquire thereafter, remains her own, free from any interest of the husband or any claim of his creditors. In some of the states, but not in all, she is permitted to convey her property by deed, or to bequeath or devise it by will. In New York and a few other states, she is allowed to manage her property as if single, to make contracts concerning it, to engage in any trade or business, to appropriate her own earnings, to sue and be sued, and to maintain actions in her own name for injuries done to her person, property, or character. As truly, as wittily said, that in the eye of the common law husband and wife are one, and that that one is the husband; but under the new legislation the wife has the same standing before the law as her husband. In the western and southern states the wife has a secure interest in the homestead, and cannot be dispossessed without her consent. The new legislation has not changed the common law presumption that it is the husband's duty to support his family, to furnish a home for his wife, and provide her with such means of subsistence as are suitable to his station in life. As a general rule it is still the right of the wife to procure the necessities of life upon his credit. She may leave him, if she chooses, and there is no law to compel her to return; but in that case, her right to a support from him will cease. If she be enticed away or seduced, the husband may recover for any pecuniary damages thereby incurred. The old rule, that he is responsible for any crime committed by her in his presence and by his direction, remains in force. In many of the American states husbands and wives may be witnesses against each other, except as to facts communicated in marital confidence.

HUSBANDRY, PATRONS OF. See GRANGE, *ante*.

HUSBANDS, HERMAN, d. 1794; prominent in the American revolution; member of the Pennsylvania legislature, and one of the leaders of the "regulators in North Carolina." He was an associate of Albert Gallatin and other patriots, but after the peace was compromised in the whisky insurrection in Pennsylvania and imprisoned.

HUSTED, JAMES W., b. N. Y., 1833; graduated at Yale and was admitted to the bar in 1857. After filling a number of local offices he was chosen to the legislature, and in 1874 was speaker of the assembly.

HUTCHINS, THOMAS, 1730-89; b. N. J.; at an early age entered the British military service and was engaged in Indian wars. He was in London in 1779 and was

imprisoned on suspicion of favoring American independence. Escaping by way of France, he came to Charleston and took service under gen. Green in the continental army. He was favorably known as a topographer and a maker of maps.

HUTCHINSON, a co. in s.e. Dakotah, on Dakotah river; 432 sq.m. Formed since the census of 1870. It is generally level, and there is very little timber. Co. seat, Olivet.

HUTCHINSON, JOHN, 1616-64; b. England; represented Nottingham in parliament, and was a member of the court for the trial of Charles I., concurring in the sentence. He was arrested, and imprisoned, and died while in confinement. A memoir of his life was written by Lucy Hutchinson, his wife, and published in London in 1806.

HUTCHINSON JOHN, 1674-1737; b. England; remembered as an opponent of Newton's theory of gravitation. He published several works containing an interpretation of the Hebrew Scriptures.

HUTCHINSON, THOMAS, 1711-80; b. Boston, graduated at Harvard, and began the practice of law. He was several times elected to the general court, and for three years served as speaker. In 1760 he held at one time four offices: judge of probate, counselor, chief-justice, and lieutenant-governor. In the time of the stamp act he favored the British government, for which his house was sacked and many valuable manuscripts relating to the history of Massachusetts were destroyed. In 1769 Hutchinson was made governor of the colony, but he did not receive his commission until 1771. It was proved by Franklin that he had displayed duplicity in his course with regard to the relations of Great Britain and the colonies. In 1774 he returned to England, where he died, having been pensioned by the government. He published *The History of the Colony of Massachusetts Bay* (down to 1750), and *A Brief State of the Claims of the Colonies*.

HUYGENS (VAN ZUYLICHEM), CHRISTIAN (*ante*). The discovery of the ring of Saturn was not made with the first telescope with which Huygens discovered the fourth (then the first) satellite. That instrument, although the most powerful then made, had a focal length of only 10 feet. The ring was discovered in 1659 with a telescope of 22 ft. focal length, which besides being much more powerful than the first, had a greatly improved construction of the eye glasses—essentially the same as those used at the present day, with the exception of the achromatic combination of lenses, a comparatively recent discovery. The discovery of the ring of Saturn was one of the master exploits of science. The appearance of two luminous bodies on either side of the planet at various times had been observed by Galileo, but his telescope did not enable him to make out anything more. The appearance of the two luminous points was found by Huygens to be caused by a position of the ring by which it reflected the sun's rays. From an examination of the subject he made calculations which foretold the disappearance of the ring from view in 1671. The discovery was published in 1659 in a volume which contained, among several other discoveries, an account of the bands upon the disks of Jupiter and Mars, and of the great nebula in Orion. His *Horologium Oscillatorium*, a part of which was published in 1658 at the Hague, was not completed till 1673, and published at Paris. This book contains 13 theorems on centrifugal force, which led to most important results in the science of mechanics, and in the same work he gives a method for finding the center of oscillation. Mersenne had proposed the problem of the center of oscillation in 1646, which was not solvable by any of the then known mathematical methods. It had attracted Huygens's attention at the time, but his youthful mind was unable to cope with the subject. However, when the last part of the *Horologium* appeared, in 1673, the problem was completely solved by a method which was the first solution of a dynamical problem in which connected material points are supposed to act on one another. Newton afterwards demonstrated these 13 theorems of Huygens in a manner of his own. Huygens's own demonstrations were found after his death among his papers. The first two theorems contain the assumption of the two first laws of motion, and in his treatise *De Motu Corporum ex Percussione* he assumed the third law of motion, which Newton afterwards expressed in the words "action and reaction are equal and opposite," an equivalent for saying that the impact of two bodies does not change the quantity of motion in them—one of the grand principles of the doctrine of conservation of forces. His works were edited by 'sGravesande in four volumes, entitled *Opera Varia*, 2 vols. 4to; in one volume, Leyden, 1724; and *Opera Reliqua*, 2 vols. 4to, Amsterdam, 1728.

HYACINTHE, PÈRE. See LOYSON, CHARLES.

HYACINTHUS, in Greek mythology a boy of great beauty, an especial favorite of Apollo, but also beloved by Zephyrus. While playing at discus with Apollo, he was struck and killed by one of the missiles thrown in jealous rage by Zephyrus. Apollo changed him into the flower known by the name hyacinth, on whose petals the Greeks fancied they saw inscribed the name of the unfortunate boy.

HYALEA, a genus of mollusks belonging to the class *pteropoda*. They are noted for the beautiful transparent glassiness of the texture of their pyramidal shells. See PTEROPODA.

HYANNIS, a seaport village in Barnstable co., Mass., on a branch of the Cape Cod railroad; pop. est. 3,300. There are a number of manufactories in the village, a high school, and five churches. It is also a place of summer resort, and is connected with Nantucket by steamboat.

HYDE, a co. in Dakota, on the Missouri river, as yet unorganized. Part of it is an Indian reservation.

HYDE, a co. in e. North Carolina, on Pamlico sound; 600 sq. m.; pop. '70, 6,445—2,378 colored. The surface is level, and the soil sandy. Rice, corn, and pork are the chief products. Co. seat, Swan Quarter.

HYDE, ANNE, 1637–71; daughter of the earl of Clarendon, married clandestinely to the duke of York, over whom she had great influence, even after he became James II. Two of her daughters (Anne and Mary) were queens of England.

HYDE, THOMAS, 1636–1703; b. England; a celebrated oriental scholar, educated at Cambridge, and an assistant to Walton in an edition of the *Polyglot Bible*. Besides correcting the Arabic, Syriac, and Persian texts, he transcribed in Persian characters the Persian translation of the Pentateuch that had been printed in Hebrew shortly before at Constantinople, and appended a Latin version of his own. The success with which he accomplished these difficult tasks met the acknowledgment of the most learned men of the age. In 1658 Hyde entered Queen's college, Oxford, to which he was shortly after made Hebrew reader. In the following year, after graduating as M.A., he was chosen underkeeper, and finally librarian-in-chief of the Bodleian library. In 1660 he was made a canon of Salisbury; in 1678 archdeacon of Gloucester. The death of Pococke in 1691 opened up to him the Laudian professorship of Arabic; and soon after, on the deprivation of Altham, he became regius professor of Hebrew and canon of Christ church. Worn out by his unremitting labors, he resigned his librarianship in 1701, and died two years later. The range of Hyde's erudition in oriental matters was vast. There was hardly an eastern tongue to be learned with which he was not familiar. He even knew Chinese—a language which very few Europeans of that day could boast of knowing. He learned it from Chin-fo-coung, a learned young Chinese brought to England by the Jesuits. His mastery of the more accessible languages of the east, such as Turkish, Arabic, Persian, Hebrew, and Armenian, is proved by his numerous and still valuable works.

HYDE PARK, a village in Norfolk co., Mass., on the Boston and Providence and the New York and New England railroad, 7 m. from Boston; pop. '80, 7,090. It is a place of residence for Boston business men.

HYDERABAD', a large district in s. India in the Deccan, intersected by many rivers of which Godavery is the chief; 95,337 sq. m.; pop. 11,000,000. It is a high tableland, having a climate unusually cool for its latitude. Cotton and wheat are the chief agricultural products. The manufactures are silk, carpets, and brocades. Cotton and timber are exported. The peninsular railway crosses the s. and e. portions of the district. About 90 per cent of the people are Hindus, though the government is Mohammedan.

HYDRAULIC FORGING, forging with the hydraulic-press instead of the hammer and anvil. The process is analogous to that of rolling. The advantages claimed for the process are that it is, in many operations, more expeditious than the ordinary modes, and also that it produces a better structural condition of the particles of the material, the force being less superficial than the sudden impact of a hammer, and moving the particles of matter near the center to a greater extent, thus rendering the forged bar more homogeneous. Every forger and observant person has noticed that in the ordinary mode of forging a bar of iron there is, when the bar is thick enough, a protrusion of material at the edges, leaving a groove in the middle of the thickness, because of the superficial parts of the bar having received the greatest spread. Rolling or forging by pressure avoids this. Forging by hydraulic pressure is practiced in Europe. At Vienna there are several presses in operation, one with a piston 24 in. in diameter, transmitting a pressure of 2,400,000 lbs.

HYDRAULIC JACK, a machine which often takes the place of the jack-screw for raising heavy weights. It is simply a form of hydraulic press, which may be placed beneath a house, or ship, or any great weight which it is desired to raise—generally consisting of a stout frame furnished with upright grooves, in which a follower may be forced upwards by a hydraulic cylinder. By proper appliances the power may be rendered almost immeasurably great. See **HYDRAULIC PRESS** and **JACK-SCREW**.

HYDRAULICS. See **HYDRODYNAMICS** and **HYDROSTATICS**, *ante*.

HYDROFLUOSILICIC ACID. See **FLUORINE**, *ante*.

HYDROGRAPHY (*ante*). The science of hydrography received a new impulse from the celebrated capt. James Cook, of the English navy, who introduced what is known as running surveying, but his system has been greatly improved. The commencement of Cook's hydrographic surveys was in 1759, when he was master of the frigate *Mercury*, stationed at Quebec with the squadron co-operating with gen. Wolfe. He commenced a series of observations of the St. Lawrence river, which were continued

until he was able to publish a chart of the river from Quebec to the Atlantic ocean. In 1763 he was sent out to survey the coast of Newfoundland, and in 1764 he received the appointment of surveyor of the coast of Newfoundland and Labrador. Wherever he was ordered he continued his hydrographic observations until the year of his death, 1779. The French had been observers of his operations, and in 1785 La Perouse was sent with two ships and a corps of scientists to visit the n.w. coast of America and to explore other parts. He made important observations there, and also on the n.e. coast of Asia. After spending two years and a half he went to Botany Bay, after which he was never heard from, except that information was obtained seven or eight years afterwards which made it probable that the ships were wrecked on a coral reef on the coast of Mallicollo. But La Perouse had sent duplicates of charts and journals up to the time of his arrival at Botany Bay. The navigating officer of the expedition, Beautemps-Beaupre, sent out to search for La Perouse in 1791 under the command of D'Entrecasteaux, wrote a work on marine surveying, which was published in an appendix to the narrative of the voyage (1808). This, however, had been preceded by Alexander Dalrymple's essay on marine surveying, published in 1771. Beautemps-Beaupre was placed in charge of the survey of the French coast, where he trained a number of hydrographers, the commencement of a corps of engineers for future exploration and surveying. Most civilized nations now have their governmental hydrographic offices, and numbers of officers and men are engaged in making surveys, but England leads all other nations in this direction, having made accurate surveys of her domestic and foreign coasts, and many of those of other nations. The most important, perhaps, of all the expeditions ever sent out by Great Britain was that of the *Challenger*, which sailed from Sheerness on Dec. 7, 1872, and returned to Spithead on May 24, 1876, having during this time traversed a distance of more than four times the equatorial circumference of the earth, and established 362 observing stations along the course traversed. The objects, however, of this expedition extended, in many respects, beyond the observation of the configuration of the floor of the ocean or of its coast line; had regard to many botanical, zoological, and geological questions. During the first year the Atlantic was crossed six times, and a diversion made from Bermuda to Halifax and back again to make observations upon the gulf stream. The ship then went to the cape of Good Hope, and from thence southward toward the Antarctic ice barrier, and after taking observations along its margin proceeded to Melbourne, Sidney, and New Zealand. Then the western part of the great area of the Pacific was examined and the adjacent part of the Malay archipelago. On leaving this for Japan, at a point n. of New Guinea, the deepest sounding of the expedition was made, and the deepest reliable sounding, it is claimed, that has yet been made, viz., 4,475 fathoms, or more than five miles. From Japan she steered due e. as far as the meridian of the Sandwich islands; thence to that group; thence to Otaheite, as far beyond the equator; from Otaheite to cape Horn; thence to Valparaiso and back through the straits of Magellan, to the Falkland islands, to Montevideo, and thence eastward half-way across the Atlantic to complete some work partly done during the first year; thence due n. in the meridian of Madeira as far as the equator; thence n.w. at some distance from the coast of Africa, following the middle line of the north Atlantic, past the Azores, and thence home. At each of the observing stations a sounding was taken to determine the exact depth; the bottom temperature was ascertained, and a sample of bottom water obtained. Some of the bottom, from an ounce to a pound, was also brought up, and at most of the stations the temperature of the water at several different depths was taken, and also a fair sample of the bottom fauna obtained by the dredge. The direction and rate of the surface water was determined, and at times attempts were made to determine the direction and velocity of the water at different depths. In addition to this, meteorological and magnetic observations were regularly taken and recorded. The work accomplished included, among many other results, the determination of the depth and configuration of the ocean basins. But little was previously known of this except what had been obtained in surveying lines for telegraph cables. Facts had been observed during these cable-line surveys which were supposed to be exceptional, but the soundings of the *Challenger*, and those of the U. S. ship *Tuscarora* and the German *Gazelle*, have shown them to be general. See SEA SOUNDING, DEEP SEA, *ante*. The methods practiced in hydrography vary with circumstances. When the advantages of good triangulation exist, a hydrographic chart can be constructed with great accuracy. The principles involved are the same as those in geodetic surveying or leveling, the vertical measurements being taken with a sounding line instead of a rod, and the element of time employed to approximate horizontal distances. A boat is started at a certain point which has been determined by triangulation, and takes a course towards another point whose position is also known. The boat is then propelled with as near a uniform rate of motion as possible, and soundings are taken in succession at regular intervals during the transit, and recorded. The plotting of this line will, of course, give the depths of water all along its course at the time it was taken. A tide gauge, which gives the state of the tide at the time, will also determine the depths of the soundings at mean low water. A number of "sounding lines," as these courses are called, having been run across the bay or harbor, or whatever sheet of water is being surveyed, and of such a number as may be thought necessary, which will depend upon the nature of the bottom, the data are obtained for the plotting of a chart. If the bot-

tom is known to be comparatively even, and no rocks or steep slopes have been found, and if it be convenient to do so, the lines may all be run in parallel directions. But when the bottom is quite uneven, and there are rocks or sunken vessels, these parallel lines should be crossed, as nearly at right angles as possible, by another series of parallel lines, and all should be as close together as practicable. When the shore cannot be used for triangulation a base line must be established, as well as circumstances will allow, by anchored boats whose distance apart may be computed by the time which sound is found to travel from one to the other; or, if the water be not too rough, by the average time it takes to row in both directions from one boat to the other; or a cord may be used to measure a distance too great. Sounding lines may then be run in different directions from these points of observation, between points which can be established, or in directions towards prominent objects on shore, and the distance traversed estimated by such means as may be most convenient, according to the resources of the engineer. It is often necessary, especially when it is impossible to run the sounding boat with uniform motion, or where the bottom is quite uneven, or the position of rocks is to be determined, to take two observations on shore with theodolites simultaneously with any special soundings, the time being determined by a ball or flag signal, or a flash made from the boat. The angles being taken between the point designated by the signal and another established point, its locality is readily established. The hydrography of the United States is in charge of the coast survey. There is a coast survey office and a hydrographic office, the latter established in 1866. See COAST SURVEY, GEODESY, and TRIANGULATION.

HYDROIDS, marine animals which have been variously classified by naturalists because of the extreme difficulty of studying their natural history. Modern classification makes them a sub-class, Hydroida, in the class Hydrozoa, sub-kingdom Cœlenterata, the representative of Cuvier's Radiata. The Hydroida possess a great deal of interest because remaining so long unrecognized in some of their phases of life. In one stage of their existence they so much resemble sea plants that for a long time they escaped recognition. Patient labor, however, has at last placed them in their proper relations. These hydroids exist in compound colonies of alternate generations, one kind having the office of feeding the community, the other of reproduction. The feeding hydroids are usually fixed, or attached to some object, and proceed from eggs of the reproductive, or medusæ hydroids, the latter in turn growing from buds produced by the former. The medusæ hydroids sometimes remain attached to the stem, or become free-swimming medusæ. The body of the nutritive hydroid is usually supported by a stem of variable length, but may rest immediately upon the bottom. From one individual buds appear and produce branching colonies of hundreds or thousands, often having a height of 15 or 20 inches. The reproductive hydroids are sometimes developed into perfect medusæ before leaving the parent stem, but they usually break away before attaining their perfect state. Some buds never become much developed, and are called sporosacs. These usually remain attached, but attain sexuality and reproductive power. The free-swimming medusæ often grow 9 or 10 in. in diameter, but many of them, it is said, remain very small, seldom attaining a diameter of more than an inch. See ACALÉPHÉ; GENERATIONS, ALTERNATION OF; ZOÖLOGY, *ante*.

HYDROPHIDÆ, a group of venomous water snakes, of which more than fifty species are known, chiefly inhabitants of the coasts of eastern seas, from India to Australia and New Zealand. In their form and movements they have a strong resemblance to eels. They have a compressed tail, and are rapid and graceful swimmers, frequenting the mouths of rivers, but are said to be incapable of living out of salt water, although nearly related to the hooded snake or *cobra da capello* of India (q.v.). They are exceedingly venomous and are much dreaded by the fishermen, whose nets often gather them. The order ORPHIDIA, to which they belong, are not all as well classified as is desirable. See SERPENTS.

HYDROPHILIDÆ, a family of coleopterous insects, called water beetles. They are great swimmers, many of the species having oar-shaped legs. Their larvæ are carnivorous, but the fully developed insect feeds on decayed vegetable matter. Some members of the family inhabit salt water. See COLEOPTERA.

HYGIENE (HEALTH, *ante*), the science of health, also called sanitary science. The word is originally derived from Hygieia, the goddess of health, a daughter of Æsculapius. Hygiene includes attention to diet, to exercise, to mental and physical habits, as well as to clothing, climate, state of the weather, condition of dwellings and of the streets and sewers of the town, or of the surface of the country. It is a subject which has received various degrees of attention in all ages, but as a science it is of modern date. However much attention may have been given to the rules and practice of exercise, and to bathing and habits of cleanliness by ancient nations, and however much knowledge they may have had of the advantages to health which were derived from their games, their baths and other observances, their want of knowledge of many of the causes of disease was a barrier to scientific knowledge. An individual may be ever so particular in the care of his person, but if he habitually breathe an atmosphere loaded with malaria, he will almost certainly at some time be prostrated with some form of fever. If science has

never analyzed for him the effluvia of the cess-pool or the pile of putrescent matter lying near his dwelling he cannot have any other knowledge which will lead him to avoid the deleterious influences of their presence. Neither can he form rules of eating and drinking, or even of exercise or bathing, which will not in some degree violate the laws of health, unless he has an extensive knowledge of the principles of physiology. Now, physiology is a modern science, and although it enables us to avoid many dangers, it is still so far in its infancy as to allow us at times to adopt erroneous habits, and our knowledge of malaria and of its propagation does not always tell us how to employ the most efficient measures against it. How then could the ancients protect themselves against the ravages of the plagues and pestilences which periodically carried them off by hundreds of thousands? And it must be confessed that modern nations, until within a very recent period, even within the lives of persons now living, have known but little more than the ancients of any practical preventives against the ravages of diseases; and moreover, it must with shame be confessed that at the present time, and in some of the most enlightened and luxurious cities, whose municipal authorities have only to ask to receive the most scientific advice from the medical profession and the aid of the most accomplished engineers, methods for riddance of pestilential matter are employed but little better than those which would be adopted by barbarians.

Omitting the considerations of the sanitary measures pursued by the Assyrians, Egyptians, Greeks, and Romans, some of which are recorded in architectural monuments preserved to this day, we find that in England in the time of Edward II., among other ordinances of a sanitary nature, there was one forbidding the sale of muzzled swine's flesh; and in the reign of Richard II. one to prevent the pollution of rivers, and subsequently, including the reign of Elizabeth, ordinances for the inspection and cleansing of sewers, and the prevention of overcrowding in tenements. But notwithstanding the attention thus early given to the subject of the pollution of rivers, some of the water that is supplied to the city of London to-day receives pollution from the sewage of towns. Much, however, has been done by men of science to point out the manner of effecting sanitary reforms, and it may reasonably be hoped that the day is not distant when as a rule municipal authorities will be compelled by process of law, or by public sentiment, if not impelled from patriotic or public spirited motives, to employ the best methods of introducing pure and non-malarialized water into our cities, and also to clean the streets and dispose of the offal and refuse in such manner as not to sacrifice human life, or even to shock public decency or discourage private enterprise.

Hygiene may be variously classified, according to its relations, and the objects in view. There is the hygiene of the individual, of the family, and of the municipality or state; which may be denominated personal, domestic, and public hygiene. Personal hygiene has little to consider beyond questions of diet, cleanliness of person, habits of thought and study, and of morals and locality of residence. Domestic hygiene regards the condition of the whole household, the apportionment of sleeping apartments to different members, the general regulation of meals and the preparation of food, and is brought into more immediate relations with public hygiene, as the householder will often need to have intercourse with the public authorities. Public hygiene has the consideration of measures for the laying out of a city, for the disposal of its refuse, for the supply of water, and the occasional enforcement of quarantine regulations. In a more enlightened sense it must also have regard for the education of the inhabitants in such a manner as will dispose them to cleanly and thrifty habits. Hygiene may be also divided into mental and physical. The former will necessarily include many questions that belong to the latter, for the healthy action of the mind depends to a great extent upon the health of the body. A sufficient amount of sleep ought to be taken to refresh the powers of the mind as well as those of the body, and that sleep ought not to be much disturbed by dreams. It is a matter of common experience in a retiring at night with too full a stomach—and with some persons with any food in the stomach—is provocative of disturbing dreams. The thoughts should be calm, and mental exercise, as well as physical, should be regularly taken. Of course there are those whose occupation demands varied, sometimes excessive exertions, and who must be "a law unto themselves." No rules of mental hygiene are possible with them, except that they shall keep the blade of the intellect as keen and as bright as possible by a fair diet, what exercise they can find time to enjoy, and be always ready for an intellectual encounter. There are lawyers and other professional men, journalists, physicians, and a few public officers whose duties are so thoroughly wound up in the progress and success of causes and enterprises, in questions of life and death, and the loss or the rescuing of fortunes, that there is scarcely such a word as *rest* with any practical import to them. But the great time for practically applying the laws of mental hygiene is during the years of childhood and youth, before the struggles of life commence. The method of teaching the child should be of the simplest as well as of the most comprehensive character, and the periods should be frequent during which its mind is completely taken away from all serious study, and allowed to come to a perfectly natural and passive condition by mirthful and affectionate enjoyment. Let the schoolrooms to which youth are sent be commodious and well ventilated, and after these advantages are secured let them not be thrown away by overcrowding. It is questionable whether the bringing together of over one thousand, or even that number, of children in one building, even though a large one, is not in violation of sanitary principles. Too

many studies should not be required, so that hours which should be given to recreation or sleep will not be occupied, as is now too often the case, with laborious efforts of study, which often do little more than produce a disturbed and unrefreshing sleep, and pervert or destroy the appetite for wholesome food. As to moral hygiene, which is a part of mental, it is necessary to say only that the strict observance of those laws which are inculcated by Christianity and sought to be enforced by the civil authorities of all enlightened nations, will be conducive not only to soundness of the whole mind, but also to soundness of the whole body.

Physical hygiene presents itself in various aspects, embracing exercise, diet, occupation, etc. Exercise is an important element of hygiene. See EXERCISE, GYMNASICS, *ante*. For the hygiene of diet, see DIET, *ante*. By the hygiene of occupation or employment is meant the hygienic influence of different employments upon the individual. It is evident that the occupation of a lawyer or journalist or physician has vastly different hygienic relations from that of a shoemaker or carpenter. It is evident that a carpenter will need but little more exercise than is given him by his occupation; but his diet, and his time and manner of sleeping, and his habits of cleanliness and bathing, will have considerable importance. It is hardly necessary to say that he should have a generous diet, should occupy an airy and well-ventilated chamber for sleeping, and that his food should usually be different from that of the shoemaker, lawyer, or doctor. It may be said in general that active laboring men, like carpenters, wheelwrights, and farmers, may partake of food which takes a considerable time to digest, with more advantage than sedentary men can. Pork and corn-cake or bread is a nutritious and sustaining diet to an active laborer, but should not form the habitual diet of a sedentary person. But the influence which the occupation of a person may have upon his health is a hygienic question which can only be hinted at in a brief treatise. The rules of hygiene are subject to change according to circumstances. That which is beneficial to one person is often injurious to another, and nothing but the application of the broadest common sense in the most catholic spirit can be expected to apply to questions as to what any person ought to eat, to drink, or as to how many miles he or she ought to walk every day. In conclusion, it may be remarked of public hygiene that it can only be regulated by the enforcement of sanitary laws; and that to be efficient, especially in cities, they need to have reference to many things. One of the most important questions of public hygiene is the cleaning of streets and matters connected therewith. Filthy streets are productive of disease not only by the generation of poisonous gases, but also the dust which results from the long-continued trituration of excrementitious and decaying substances is extremely injurious to the mucous membrane of the air passages, and productive of contamination to blood and tissue. The habit of casting the sweepings of houses and stores, upon the sidewalks, especially during the hours in which pedestrians are passing, which is so prevalent in most of our cities, is a greater evil than many suppose. The dust of these places is often of the most objectionable character, containing the germs of contagion, and there is no doubt that many filthy diseases are propagated in this manner. It is impossible to see how such abuses can be remedied, except by municipal regulation.

Public conveyances are frequent causes of disease from various sources. The dust which is allowed to collect in street cars, and also ordinary steam railway cars, is of itself a frequent cause of diseases of the air passages; but compared to the evils which result from overcrowding and bad ventilation, it is of minor importance. The overcrowding which is deliberately practiced on some of the street railroads, coupled with the draughts of cold air from windows opened regardless of comfort, is undoubtedly a considerable factor in the death-rate of our large cities. Pneumonia, pleurisy, bronchitis, and laryngitis are frequent results of street-car exposure. But one of their greatest evils, and one not yet sufficiently recognized by the public, although well known to the medical profession, is the want of attention paid to the smoothness of the track and the springs of the cars. This is commonly regarded as a matter of comfort, but this is its least important aspect. There is a disease recognized in legal medicine called railroad disease. It is a nervous affection, caused by the continuous vibration of the cars. This vibration cannot be entirely avoided on rapid trains, but on some roads is so nearly so that little mischief probably results from this cause. On street cars undue jarring should not be permitted. When they are properly supplied with springs, and the seats cushioned, all injurious vibrations will be avoided, even when the track is not perfectly smooth. A delicate lady is often seriously injured by riding in a car on a bare wooden seat, without a cushion to relieve the jar resulting from the imperfect springs, and physicians are constantly meeting with patients whose diseases are directly traceable to this cause. Several years ago, when the street cars, which were then cushioned, became so filthy as to be known agents of contamination, the abandonment of cushions was popularly hailed as a relief. It was, however, only a partial relief, from filthiness; it has been injurious in another direction, but there is no reason why the seats of all public conveyances, which are paid, as a rule, in proportion to the amount of wear entailed by travel, cannot be comfortably cushioned and kept clean. Hygiene has its thousand relations to all the habits and conditions of life, and although many of them lie within the limits of private life and cannot be subjected to legal interference, gross violations of sanitary laws ought not to be permitted in public establishments. See WARMING AND VENTILATION.

HY'RIDÆ. See TREE FROGS, *ante*.

HYLOBATES. See GIBBON, QUADRUANA, and VERTEBRATA.

HYMNOLOGY (HYMN, *ante*). I. *Scripture psalms and hymns*. The sacred writings record strains of poetry, music, and song which furnish a model for the praises of the church through the ages. The book of Job, generally regarded as the oldest, declares that, at the creation, "the morning stars sang together and all the sons of God shouted for joy." Moses led Israel into the wilderness with a song of praise—"I will sing unto the Lord, for he hath triumphed gloriously"—and brought them to the end of it with a doxology—"There is none like the God of Jeshurun, who rideth on the heaven in thy help." Centuries after, during troublous times, Deborah's song mingled a woman's tenderness with a warrior's joy—"Lord, when thou wentest out of Seir, the earth trembled and the heavens dropped." Afterwards Hannah's song is given—"The Lord maketh poor and maketh rich." From the heights of Bethel, in Samuel's day, "a company of prophets came down with psaltery and tabret, and pipe and harp." David, the sweet singer of Israel, composed among his flocks the psalm, "The Lord is my shepherd;" and, when he brought up the ark to Zion, appointed Levites, with instruments of music, to sing, in the worship of the sanctuary, "Give unto the Lord, ye kindreds of the people, give unto the Lord glory and strength." With David other psalmists were united; and yet others, ages after, added to their work. From the depths of the captivity came the mournful strain, "By the rivers of Babylon there we sat down," followed with thanksgiving when the captivity was turned. The Psalms completed have filled with the voice of praise not only the Jewish temple, but also the sanctuaries of all lands where the Lord is worshipped. The voices of the prophets repeated and prolonged the songs of Moses, "God came from Teman and the Holy One from Mount Paran; his glory covered the heavens, the earth was full of his praise." After long silence their last promise was caught up by Zacharias, "Thou, child, shalt go before the face of the Lord to prepare his way;" and Hannah's thanksgiving was renewed, in even gentler tones, from Mary's lips, "He hath put down the mighty and exalted them of low degree." Soon, on the plains of Bethlehem, glad tidings of great joy for all people were proclaimed, and that song of the angels was heard which has floated down the centuries, "Glory to God in the highest, and on earth peace, good will toward men." Mingled with these were various human songs, from that of Simeon, "Lord, let thy servant now depart in peace," on to the hosannas on the mount of Olives and in the temple, the hymn at the institution of the supper, and the ascriptions of praise after the ascension. In the prison of Philippi praises to God were sung at midnight; in the early Christian worship, psalms, hymns, and spiritual songs were directed to be habitually used; and, in the closing of the Revelation, some of the songs of heaven were sent down to instruct and comfort the church on earth: the ascription of holiness and sovereignty to God, "Holy, holy, holy, Lord God almighty;" the song of redemption, "Worthy is the Lamb that was slain;" the song of Moses and the Lamb, "Great and marvelous are thy works;" and the wedding-song of the church in heaven, the bride of Christ, "Alleluia, for the Lord God omnipotent reigneth." II. *Hymns of the ancient Christian church*. Basil quotes an evening hymn from an unknown author. Pliny the younger, at the beginning of the 2d c., in describing Christians by characteristic marks, says that they were accustomed to sing hymns to Christ as to God. The oldest hymn that remains complete from the period of persecution is that of Clement of Alexandria, which, though not remarkable as a poetical production, gives utterance to the emotions of love and thankfulness to Christ which filled the hearts of the early believers. Many of the Gnostics composed sacred songs in imitation of orthodox Christians as a popular means of diffusing their doctrinal views. One of these, Bardesanes, in the Syrian church of the 2d c., wrote 150 to correspond in number with the Psalms, which he imitated also in style and structure, thus "presenting to simple souls a poisonous cup tempered with seductive sweetness." Ephraem Syrus, on the other hand, representing the Syrian hymnology, endeavored to counteract the Gnostic songs. In the Greek church, Arius, like the Gnostics, wrote hymns "for the sea, the mill, and the highway, which he set to music," and, by the practical Christian spirit which he infused into them, made them more popular than those of the orthodox church. Chrysostom endeavored to neutralize their influence in Constantinople by productions of his own pen. So general was the diffusion of these various songs that Jerome says no one could go into the fields without hearing the plowman singing hallelujahs, the mower hymns, and the vine-dresser David's psalms. The Greek sacred poetry, the work of nine centuries, has been, in a great degree, restricted to the oriental church. Most of it, pervaded with the superstitions of the east, is unfitted for general use. Some of the most valuable, however, has lately been well translated into English by Neale. The hymns of the Latin church are greatly superior in evangelical qualities to those of the Greek. The best of them, through translations and paraphrases, have become familiar in Protestant churches. The most celebrated one is *Te decum laudamus*, sung over all Christendom, and generally attributed to Ambrose, bishop of Milan, about 370 A.D., though some critics now assign it variously to other authors of later date. Many of the Latin hymns, however, like the Greek, celebrate the praises of Mary and the martyrs, and for Protestant ears are marred by various superstitious errors. The

famous one of Thomas Aquinas, *Pange, lingua, gloriosi*, it has been said, "fixes the epoch of transubstantiation, the point at which the rhetoric of the pulpits froze into the logic of the schools." During the middle ages large numbers of hymns were written in the cloisters of Germany and France. The authorship of some of the best is uncertain or unknown. *Veni, Creator Spiritus*, translated by Dryden, has been ascribed by some to Charlemagne and by others to Maurus. The *Dies Irae* was written by Thomas of Celano, and the *Stabat Mater* by Jacopone. III. *Modern hymns.* 1. *German.* The earliest known German hymns belong to the 9th c., at which time, in a few churches, the people continued the old practice of joining in the response *Kyrie eleison* at certain intervals during the singing of the Latin hymns. To this were added a few German rhymes which constituted their earliest hymns, but were restricted at first to popular festivals and pilgrimages. In the 12th c. sacred songs in the national language were more freely written. Some translations also from the Latin became favorites among the people. But while a part of the German hymns were evangelical, others, like many of the Greek and Latin, were extravagant ascriptions to the virgin Mary of the attributes belonging to her divine son. Hymns in the national language were largely used also, by the Flagellants, Bohemians, Waldenses, and other sects, in connection with their study of the Scriptures. The reformation produced a great revival of sacred song throughout Germany as a natural accompaniment of liberty to worship God in the national language and to read his word. Luther not only translated the Bible, but also labored to make the practice and knowledge of music general throughout the land. Besides newly translating many of the best Latin hymns, he was himself the author of more than twenty, most of which have been widely diffused among Protestant nations, some of them being special favorites with all English speaking people. His *Ein feste Burg ist unser Gott*, Heine called the *Marseillaise* of the reformation. The thirty years' war, with all its disasters and sorrows, greatly stimulated the activity of the German mind and produced "a great outburst of religious song" from famous authors, among whom were Opitz, Fleming, Rist, Heermann, and, a little later, Gerhardt, the prince of German hymnists, whose songs are "pervaded by a spirit of cheerful piety showing itself alike in love to God and Christ, to nature, and to mankind." After him followed Frank, Neumark, Silesius, and other well-known names. The school of pietists, which for nearly a hundred years exerted a powerful influence on the religious and social life of Germany, furnished also some celebrated writers of hymns, among whom were Spencer and Freylinghausen. The latter published a collection which was cherished by pious persons for several generations. In South Germany Hiller's *Spiritual Songs* was very popular, and is said to be "still the commonest book in Württemberg next to the Bible." Among the mystics, Arnold and Tersteegen have written some hymns which are justly esteemed. Among the Moravians count Zinzendorf was remarkable as the author of more than 2,000 hymns, some of which are excellent. The prevalence of rationalism in Germany was unfavorable to hymnology. In connection with the "critical doubting" there "sprang up a mania for altering the classical hymns, consecrated, as they were, by so many associations." The alterations consisted in weakening the old strength and changing religion into mere morality. The process was popularly known as "hymn-book watering." It was, however, only partially successful. Often the genuine emotion produced by the singing prevailed over the rationalism of the pulpit. Among the evangelical poets of the time, Gellert, Klopstock, and Cramer are justly esteemed. In South Germany and Austria great progress was marked by the permission which was officially given to use vernacular hymns in the Roman Catholic churches. Though many of those adopted were translations from the Latin, yet in the original compositions the style of Gellert and Klopstock was imitated, and some of their hymns, even, were introduced. At the present time the reaction from rationalism is marked by a corresponding improvement in the style and quality of the hymns. The German evangelical church has produced in all about 80,000 devotional songs of various sorts and grades. 2. *French.* The Roman Catholic church of France continues to use in its public choral worship the old language of the Vulgate and the Breviary. The sacred songs of Madame Guyon give expression to the deep religious experience, abounding in peace and joy, which, as Wesley says, she truly possessed notwithstanding her errors of opinion and the sufferings brought on herself by her great mistake in following, as inspirations, her own inward impressions, instead of the directions of the written word. In later times, hymns in the French language have been freely used among the lower classes by Roman Catholic missionaries who, learning wisdom from Protestantism, employ against it one of its own chosen instrumentalities. The Reformed French church retains its version of the Psalms which, commenced by Marot in the early part of the 16th c., and finished by Beza, exerted great influence on the religion of the land. Its words, set to native airs, were cherished in the hearts of the people and were sung in the crowded cities, in the vineyards, on the rivers, and even during hunting expeditions of the king. Thus it powerfully aided the work of the reformation. In recent times, César Malan of Geneva has written many excellent hymns which express warm devotional feeling and clear scriptural truth in simple and flowing verse. Vinet also, in addition to his eminent attainments as a preacher and teacher of theology, was the author of a few hymns that well exhibit the thoughtful and ardent spirituality of his nature. 3. *English.* In England there has been a great deal of sacred poetry that cannot strictly be called hymns.

The publications of the Percy society contain specimens of devotional song that are ascribed to the 13th c., and the reign of Edward I. In the 14th c., Chaucer, "the father of English poetry" in its other branches, also "made many a hymn for holy days." After him no eminent poets appeared until the age of Elizabeth, during which the production of sacred verse was greatly increased: Among the writers of it were queen Elizabeth, archbishop Parker, Edmund Spenser, sir Walter Raleigh, lord Bacon, and sir Philip Sydney—joint author with his sister, the countess of Pembroke, of a metrical version of the Psalms. Another version, commenced by Sternhold and finished about 1562 by Hopkins with some assistance from other authors, though deficient in refinement and inferior in other respects, was marked by rugged strength as well as bold harmony and contained some stanzas which are still greatly admired. It became popular and, appended to the book of common prayer, continued long in use. The 17th c. produced the saintly Herbert, the quaint old Quarles with Vaughan, Southwell, and, above all, Milton, who, in addition to *Paradise Lost*, was the author of a noble Christmas hymn and other sacred lyrics. The dramatists also of that age, Ben Jonson, Beaumont, Fletcher, and, greatest of all, the "myriad-minded" Shakespeare, furnished many specimens of sacred poetry which show the influence of Christianity on their intellects and hearts. The version of the Psalms by Rouse, an English Puritan, commended by the house of commons to the Westminster assembly and published in 1646, was generally used by British Presbyterians of that day and still holds its place in many of their congregations both in the old world and the new. At the close of the c., Tate and Brady's version was made, and, although "inflated, smooth, and insipid," soon superseded Sternhold and Hopkins as an appendage to the prayer book, which it still continues to be. Ten years before it, Mason's *Spiritual Songs* appeared, excellent in themselves and destined to prepare the way for still nobler strains that were soon afterwards heard. Dr. Watts, it is said, owed much to them. During all the time thus briefly reviewed, in the English cathedrals and other churches besides the Psalter, the Gloria, Te Deum, and some hymns of the middle ages, continued to be sung. On the threshold of the 18th c. bishop Ken's morning hymn, beginning with *Awake my Soul*, and closing with the doxology, *Praise God from whom all blessings flow*, entered on that stage of duty which now, like the sun, encircles the earth. About the same time Isaac Watts wrote for a single congregation the first of the "songs before unknown," many of which have been cordially adopted by nearly all denominations of Protestant Christians. His cradle hymn has been sung in myriads of homes, and his divine songs for children, charming to them, have been acceptable to men of gifted minds. It is a pleasing coincidence that Ken's doxology and Watts's spiritual songs, which are now sung together in so many churches of different lands, together also marked the advent of modern English hymns. Doddridge was a child when the hymns of Watts were published, and, having become much attached to them, derived from them, it may be supposed, something of the poetic and devotional feeling which is expressed in his own hymns, many of which have entered into the life of the evangelical churches. Charles Wesley, a few years younger than Doddridge, became intimately connected with his older brother in the labors of the Methodist itineracy, and, during intervals of toil, wrote 7,000 hymns, many of which are highly esteemed for their lyrical excellence, religious fervor, and varied Christian experience. They owe much of their success, also, to the influence of the great revival of religion, in the midst of which he labored and which they, in their turn, so largely promoted. Some of them are rendered more interesting by the peculiar circumstances which suggested them. At the beginning of his Christian life, while shrinking back from a public profession of his faith, a friend said to him: "If you had a thousand tongues you should publish the gospel with them all." This led to the hymn, *Oh for a thousand tongues to sing*. Standing on the extreme projection of Land's End, he wrote, *Lo! on a narrow neck of land*. His judgment hymn was written just after the earthquake which destroyed Lisbon. Toplady, widely separated from the Wesleys in theological opinion, has been closely united with them in influence by his *Rock of Ages, left for me*. After these came Olivers, Cennick, Beddome, the countess of Blessington, and Annie Steele. The Olney hymns, by Newton and Cowper, contain among many other favorites, *Amazing grace, how sweet the sound; How sweet the name of Jesus sounds; and Sometimes a light surprises*, written by the former; and by the latter *Oh for a closer walk with God; There is a fountain filled with blood; and God moves in a mysterious way*. Robinson wrote *Come thou fount of every blessing*; Logan, *Where high the heavenly temple stands*; Medley, *Awake my soul in joyful lays*; Kirk White, *The Lord our God is full of might*; Perronet, *All hail the power of Jesus' name*; Thomas Moore, *Come, ye disconsolate*. James Montgomery, a Moravian Christian and a gifted poet, has enriched English hymnology with precious songs too numerous to be specified and too highly valued by the church at large to need commendation here. Lyte is the author of *Jesus! I my cross have taken*; Sarah F. Adams, of *Nearer my God to thee*; Charlotte Elliott, of *Just as I am without one plea*; sir John Bowring, of *In the cross of Christ I glory*; bishop Heber, of *From Greenland's icy mountains*. Keble's *Christian Year*, while it contains many hymns that are precious to all Christians, is said to have contributed greatly to the success of *Tracts for the Times*. "In its pensive, dreamy, soothing strains, we have the logic of the Oxford schools turned into rhetoric. The academic cloister and the Gothic aisle are the haunt and main region of his song. The white Levitical vestment

is his singing robe, and you listen, in the dim religious light, to a music like the lulling chime of church bells." 4. *American*. The first American edition of Watts's Psalms and Hymns was published in 1741 by Benjamin Franklin, then a Philadelphia printer and comparatively unknown. These among Congregational, Baptist, and Presbyterian churches, with a collection of Wesley's hymns among Methodists, were, for many years, almost the only books in general use. In 1800 president Dwight, at the request of the general association (Congregational) of Connecticut, prepared an edition of Watts, with many additional hymns, some of which, from his own pen, are of great value. Among these are: *I love thy kingdom, Lord*, and *While life prolongs its precious light*. In 1818 Dr. Worcester of Salem, Mass., added to the unchanged Watts a copious selection of the best hymns then accessible. In 1830 Dr. Leavitt's *Christian Lyre* appeared; in 1831, *Church Psalmody*, by Dr. Lowell Mason and rev. David Green; in 1832, *Spiritual Songs*, by Drs. Mason and Hastings; in 1858, the Plymouth collection, by rev. Henry Ward Beecher, and the Sabbath Hymn Book, by profs. Park and Phelps, and Dr. Mason. By that time all the barriers had given way and new hymn books have since been introduced among all denominations. In these various collections, besides the productions of English authors already mentioned, there are many choice American hymns. Among these may be cited: *Softly now the light of day*, and *Ping out the banner, let it float*, by bishop Doane of New Jersey; *I could not live alway*, by Dr. Muhlenbergh; *How beautiful were the marks divine*, and *Oh! where are kings and empires now*, by bishop Cox; *Oh sacred head, now wounded*, translated by Dr. James W. Alexander, from Gerhardt's German hymn; *It is not death to die*, by Dr. Bethune; *My faith looks up to thee*, and *Jesus! these eyes have never seen*, by Dr. Ray Palmer; *Blest comforter divine*, by Mrs. Sigourney; *One sweetly, solemn thought*, by Phæbe Carey; *I love to steal awhile away*, by Mrs. Phæbe H. Brown. These and many more have greatly enlarged the list of psalms, hymns, and spiritual songs, in which the Christian church of all denominations can now worthily sing praises to the Lord. And, during all these years of advancement in hymns for the church, great attention, also, has been given to providing special hymns for children. The collections of these are very numerous and of various degrees of merit—few, however, of highest rank. Among the earliest was Bradbury's *Golden Chain*, and among the latest is Dr. Charles S. Robinson's *Spiritual Songs for Sabbath Schools*. In general, the public taste in hymnology is growing more critical, and demands are heard from various quarters for a disregarding of many of the hymns which have swollen recent hymn-books to such great proportions. It is claimed that good prose is better than poor poetry, and that when devotion calls art to its service it should secure at least sufficient art to produce correct rhyme and rhythm.

HYOID BONE, the tongue bone, or V-shaped bone, so named from its resemblance to the Greek letter *upsilon*. It is sometimes spoken of as unimportant in man, compared to the so-called hyoid bone in many of the lower animals, in which, on account of its being a support for branchial apparatus, it is often developed to a great size. But its importance is no less in man, because of its connection with the principal lingual organ; the perfection of its form and its exact location at the base of the tongue being a considerable element in the apparatus for the formation of articulate and musical sounds.

HYPERIDES, an Athenian orator, one of the ten comprised in the Alexandrian canon; the contemporary of Demosthenes. After studying philosophy under Plato, and oratory under Isocrates, he began his public career as an advocate in the Athenian courts of justice, and joined the patriotic party, at that time led by Demosthenes and Lycurgus. He fitted out two triremes at his own expense for the Eubœan expedition of B.C. 358. His whole public life, for the next 20 years, was spent in devising means of resistance to the growing power of Macedonia. In 338 B.C., when the disastrous fight of Chæronea laid Greece at the mercy of Philip, Hyperides proposed that the citizens should send their wives and children to places of security, and fight it out to the last. Though this desperate advice was not taken, its genuine patriotism was appreciated and rewarded by his countrymen. When the death of Philip revived the hopes of the anti-Macedonian faction, Hyperides promoted the alliance with Thebes; and after the destruction of that city by Alexander, was one of the orators demanded of the Athenians by the young victor. Alexander, however, did not press his demand, and Hyperides continued to oppose the Macedonian influence as strongly as ever. The arrival in Athens of Harpalus, the run-away treasurer of Alexander, then absent on his eastern conquests, disturbed the friendly relation that had hitherto subsisted between Hyperides and Demosthenes. Harpalus had embezzled 5,000 talents of the public money, with which he endeavored to organize a party for himself among the Athenians. It was believed that, among others, Demosthenes had yielded to his bribes and specious stories, and Hyperides was selected to prosecute his ancient friend. This led to a rupture, which was not healed for some time. In the Lamian war, which followed the death of Alexander, Hyperides took a leading part; and when it was brought to a close, spoke the funeral oration over his countrymen who had perished in battle. This oration was looked upon as a masterpiece by the ancients. The following year (B.C. 322) saw the hopes of Athens finally crushed at the battle of Crannon. The chiefs of the patriotic party sought safety in flight. Hyperides was overtaken at Ægina by the

minions of Antipater, and put to death. Seventy-five orations were attributed to Hyperides; but a third of these were rejected as spurious by the ancients themselves. Westermann has preserved the titles of sixty-one of these in his *History of Greek Oratory*.

HYPODERMIC INJECTIONS, medicines introduced with a syringe beneath the skin. This method is often preferable to that of giving them by the mouth. The stomach is sometimes in a condition which will not bear the presence of drugs, particularly narcotics, and these are the agents which are most frequently administered hypodermically. A small graduated glass syringe armed with a silver point, cut off obliquely so that its sharpened extremity may easily be made to pierce the skin, is used. The medicine may be thrown in just beneath the skin, but the point of the syringe is often thrust into the body of a muscle. The wounding of blood-vessels or nerves should be carefully avoided, and therefore the operation should never be undertaken except by a physician or an anatomist. Local pains may generally be more successfully treated in this manner than by the common method. In some cases an anæsthetic may, however, be preferable. It is usual to make a special preparation of the drug which is to be introduced. Morphia may be given in the form of sulphate, but some physicians prepare an acetate, according to directions given in the dispensaries. The syringe must be completely filled when used, otherwise the introduction of an air-bubble into a vein might be attended by danger, and if only thrown into the cellular tissue may cause inflammation and abscess. Other medicines than opiates are sometimes used, but they should all be used with caution. Habitual narcotization by means of hypodermic injections is as productive of a habit of opium taking as swallowing it, and physicians are often meeting with patients who will complain of pain at every visit, and beg for the use of the syringe.

HYPÖGENE (Gr *formed beneath*), a geological term proposed by Lyell as a substitute for what is often called primary. He considered the latter term often inappropriate, because many granites are evidently of more recent formation than some secondary rocks. See **GEOLOGY**.

HYPOPHOSPHITES, salts of hypophosphorous acid. The term is generally used in reference to certain medicinal salts. These are chiefly the hypophosphites of soda, potash, lime, ammonia, and iron, and more recently that of quinia, although this latter has not gained admittance into the pharmacopœias. The first four were proposed as specifics for pulmonary consumption, but although they have been used with some advantage in this disease, and in affections of the blood and of the digestive organs, they have failed to cure consumption. The hypophosphites of soda and lime are sometimes used in cases of debility, especially that depending upon prolonged lactation, but they need to be supplemented by ferruginous and other tonics.

HYPOSULPHITES, salts of hyposulphurous acid with bases. The most important are the hyposulphites of sodium, calcium, and sodium and silver. The last named double salt has recently been used as a topical application in place of nitrate of silver, than which it is more mild in its action. The hyposulphite of calcium has recently been used as a substitute for the sodium salt, or in similar diseases; but the latter substance, the hyposulphite of sodium, is the salt best known of all, and is used in the arts as well as in medicine. Among other methods, it may be prepared by digesting a solution of sulphite of sodium with flowers of sulphur, at a temperature somewhat below ebullition. When carefully prepared, it exists in large colorless crystals, having a mild, saline, sulphurous taste, very soluble in water, but insoluble in alcohol. It has the property of dissolving the chloride, bromide, and iodide of silver, and is used by photographers to dissolve away the silver compound which remains undecomposed upon the plate after its exposure in the camera. It is also used in chemical analysis to separate baryta from strontia in solutions of their salts. There are some very delicate tests for this salt; one of the most delicate is iodide of starch. The blue color which is produced by the suspension of almost infinitesimal quantities of this compound, is discharged by the addition of merely a trace of hyposulphite of sodium. Another test, recently discovered by Mr. M. Carey Lea, is ruthenium: an ammoniated solution of a salt of this metal, when boiled with hyposulphite of soda, turns to a rose-color, and then to a very rich carmine, which in strong solutions becomes almost black. The strong solution diluted produces various shades of color, rivaling aniline. In consequence of the power possessed by hyposulphite of sodium of destroying ferment organisms, it has been used as a remedy in zymotic diseases at the suggestion of Dr. Polli, of Milan; and reports from various quarters are that its use has been successful. Dr. Baxter, of Moscow, Iowa, reports having employed it in more than 100 cases of intermittent and remittent fever, without one failure. Dr. Corwin, U.S.N., in the treatment of small-pox on ship at Yokohama, reports its use with good results. The dose is from 10 to 20 grains three times a day, dissolved in a few ounces of water. It may be used as a lotion in skin-diseases in the proportion of a dram to a fluid ounce of water. See **SULPHUR**.

HYPOTHECATION indicates the right which a creditor has over something belonging to another, by which he may cause it to be sold to pay his claims. Conventional hypothecation is by agreement of the parties. General hypothecation implies about the same as an assignment for the benefit of creditors. Legal or tacit hypothecation is made

without agreement between the parties. The public treasury has a lien on the property of public debtors, a landlord a lien on goods leased, and so mechanic's liens may be considered a form of hypothecation.

HYPSONOMETRY. See **HEIGHTS, MEASUREMENT OF**, *ante*.

HYSTASPES, supposed to be the author of a work containing predictions of Christ and the future of his kingdom. Of his life nothing is known, and the book itself has disappeared. It is known only by mention made of it in later writers. It seems to have been a post-prophetic announcement of the coming and kingdom of the Savior.

HYSTEROTOMY. See **CÆSAREAN OPERATION**, *ante*.

HYTÚ, or **ITÚ**, a t. in the province of São Paulo, Brazil; pop. 10,000. It is in a fertile region on the Feite river, and has a large trade in mules.

I

IABADIUS, a name given by Ptolemy to an immense island of the East Indies near Malacca. It abounded in grain and gold. It is thought by most investigators to be Java.

IALYSUS, an important Doric city of the island of Rhodes, very flourishing in the time of Homer, remains of whose former greatness are still found in the village of Ialisco. Of its origin nothing is known.

IANTHINA. See **JANTHINA**, *ante*.

IAPETUS, supposed by some to be the Japhet of the Bible. The Greek and Roman mythology considered him as the father of the human race. In classic mythology he is the son of Cœlus and Terra, and father of Atlas, Prometheus, and Epimetheus.

IBERIA, a parish of Louisiana, lying on the gulf of Mexico, and intersected by Bayou Teche; 600 sq.m.; pop. '80, 16,686. Soil, fertile; surface, low and level; staple products: cotton, maize, and sugar-cane. There are forests of cypress and live-oak and beds of rock-salt. Cap., New Iberia.

IBERVILLE, a parish of Louisiana, bounded w. by Atchafalaya bayou and e. by the Mississippi; 450 sq.m.; pop. '80, 17,600. The surface is low and level, and often inundated; land near the rivers is fertile. Staple products: cotton, maize, sugar, and molasses. Cap., Plaquemines.

IBERVILLE, co. of Quebec, Canada, e. of the river Richelieu; 190 sq.m.; pop. '70, 15,413; traversed by the Vermont Central, the Stanstead, Shefford, and Chambly railroads. Cap., Iberville.

IBERVILLE, PIERRE LE MOYNE, Sieur d'; 1661-1706; b. Montreal; one of eleven brothers distinguished in the French service. In 1686 he joined the expedition of De Troye from Canada against the English forts on Hudson's bay; in 1690 took part in the Indian and French massacre of the inhabitants of Schenectady; in 1694 captured Fort Nelson on Hudson's bay; in 1696 destroyed St. John's, Newfoundland, taking most of that province from the British; and in 1697 defeated them in naval fights in Hudson's bay. Sailing from Brest in 1698 with two frigates he reached the mouth of the Mississippi with his brother Bienville; fortified Biloxi, the first post on the Mississippi, and in 1700 ascended the river. In 1701, on account of the unhealthiness of the climate, he transferred the colony from Louisiana to Mobile, and began the settlement of Alabama. In 1702 he fortified Dauphin island, in Mobile bay; in 1706, with three ships, he captured the isle of Nevis, one of the Leeward group. He died at Havana, Cuba, July 9.

IBN-GANACH, ABULWALID MERWAN, or JONAH DJANAH, 995-1050; b. Cordova; a distinguished Jewish scholar. Removing to Saragossa he gave up the practice of medicine to devote himself to philological studies. His greatest work consists of two parts; the first chiefly a Hebrew grammar, and the second a Hebrew lexicon. The original is at Oxford, where it was of great service to Gesenius in the preparation of his thesaurus. Specimens of it, given by Gesenius and translated by Dr. Robinson, were published in the *American Biblical Repository*, 1833. The part which treats of Hebrew grammar was published by Kirchheim (Frankfort-on-the-Main, 1856). "This gigantic work is the most important philological production in the Jewish literature of the middle ages. The mastery which it displays of the science of the Hebrew language in all its delicate points, the lucid manner in which it explains every grammatical difficulty, and its sound exegetical rules, have few parallels up to the present day." Ibn-Ganach was a proficient, also, in metaphysical studies, and composed a treatise on logic, in which he followed Aristotle. He strenuously opposed the speculations of Ibn Gebirol and others of his day on the relation of God to the world as, in his view, dangerous to the maintenance of faith in the Scriptures.

IBYCUS, a Greek lyric poet, b. at Rhegium, Italy, in the 6th c. B.C.; lived mostly at Samos in the court of Polycrates. His writings are known only by fragments. A legend relates that when traveling he was waylaid by robbers near Corinth, and murdered. Looking up, mortally wounded, he saw a flock of cranes flying overhead, and implored

them to avenge his death. The murderers went to Corinth, and in the theater saw the cranes hovering over the people. One of the murderers, in terror, cried out, "Behold the avengers of Ibycus." Inquiry led to discovery and punishment.

ICA, a t. of Peru, 170 m. s.s.w. from Lima, and connected by railway with Pisco, its port. It exports much wheat, maize, olive-oil, wine, and brandy.

ICARUS. See DÆDALUS, *ante*.

ICENI, a warlike tribe of ancient Britain, occupying, as is supposed, that part of the country which corresponds nearly with the present counties of Norfolk and Suffolk. Under their queen Boadicea they rebelled against the Romans.

ICH DIEN, translated to mean "I serve," the motto of the prince of Wales. According to one theory of its derivation, the phrase was employed by Edward I. on presenting his now-born son, Edward of Carnarvon, to the Welsh, using the expression in its Welsh signification—*Eich dyn*, "Behold the man." Another view attributes it to the occasion of the killing of John, king of Bohemia, by the black prince at Cressy, and asserts that the latter found the motto under the plume worn by the dead king, and assumed it to imply that "he served under the king his father."

ICHOLOGY (*ante*). The fossil footprints, or ichnolites, of crustaceans are very numerous in America. Dr. Dawson has given much attention to this study. In observing the habits of the king crab he found that in walking over a sandy beach it makes marks like those called protichnites (see *ante*). In the sandstone beds which contain the protichnites are ladder-like impressions called climactichnites, and Dr. Dawson has shown that probably they are the marks made by the same crustacean, when swimming, which, when walking, produced the protichnites. The ichnolites found in the cocene of the Paris basin are numerous, the most notable being the trilobed footprints of several species of *palæotherium* (q.v.), and also those of *anoplotherium* (q.v.).

Great interest attaches to the footprints in the mesozoic rocks of the Connecticut valley from the fact that a majority of the tracks formerly supposed to have been made by birds were made, as shown by prof. Edward Hitchcock, by a huge batrachian, or frog-like animal. In his report published by the state of Massachusetts in 1836 he states that he had found ichnolites in the new red sandstone in 38 localities. In all there were the footprints of no less than 119 species of animals, comprising quadrupeds, birds, saurians, batrachians, tortoises, fishes, crustaceans, insects, and worms. Some of the surfaces show ripple-marks, and others rain-drop marks. The collection of the Connecticut valley ichnolites is now in the museum of Amherst college, and comprises more than 8,000 distinct tracks. Ichnolites have since been found in the same formation in New Jersey, and in the lower triassic sandstones of Lancashire and Cheshire in England, and in Hildburghausen, Saxony. The European footprints somewhat resemble an impression of the human hand, and for a while were supposed to be the footprints of a quadruped called *cheirotherium*, belonging to the kangaroo family. It is now, however, thought that the tracks are those of a crocodilian called *labyrinthodon*.

ICHTHYOLOGY. See FISHES, VERTEBRATA, *ante*.

ICTINUS, a contemporary of Pericles. He was the chief architect of the Parthenon of Athens, 438 B.C., the temple of Epicurius in Areadin, and the Eleusinian temple.

IDA, a co. in w. Iowa; 432 sq.m.; pop. 70, 226. Its soil is very fertile. Staple products: grain, potatoes, and sorghum. Capital, New Ida.

IDALIO (*ante*), a mountainous territory of the United States on the Pacific slope of the Rocky mountains, embracing many of the sources of the Columbia river; between lat. 42° and 49° n., and lon. 111° and 117° 10' w.; bounded n. by British Columbia, which it touches only by a narrow strip, w. by Oregon and Washington territory, e. by Montana and Wyoming territories, and s. by Utah and Nevada. The e. line is irregular, following most of the way the course of the Rocky and Bitter Root mountains, so that the breadth of the territory, which is nearly 300 m. on the s., is less than 50 m. on the north. The length of the territory from n. to s. is nearly 500 miles. Its area embraces 86,294 sq.m., or 55,228,160 acres, of which only 16,925,000 acres are suited for agriculture, and 5,000,000 for grazing; over 14,000,000 acres which are now sterile might be reclaimed by irrigation. The mountain, timber, and mineral lands cover an area of 33,900,000 acres; the lakes 575,000 acres. Its arable portions are chiefly found in the river valleys and around the lakes; and even many of the valleys, notably the upper valley of the Salmon river, lie at so great an elevation, and surrounded by such a breadth of lofty snow-capped mountains, that the season between severe frosts is too short to permit much development of agriculture.

The mountain system of Idaho is peculiar, and its central uplifts are too separate, extensive, and lofty to be ranked as mere spurs of the Rocky mountain chain. The Salmon river range, which occupies the central part of the territory, a portion of which, near the sources of that great river, is known as the Saw-tooth range, is one of the most picturesque and lofty ranges of America. It covers an area as large as the state of New Jersey. The Snake or Shoshone river valley encircles it e., s., and w., and the Salmon river, w. of Salmon City, on the north. The following large tributaries of the Snake river all have their sources within a few miles from the junction of lat. 44° with

long. $114^{\circ} 30'$, viz.: the Salmon, flowing n.n.w.; the Wood river, flowing s.s.e.; the Little Wood, in the same direction; the Lost river, s.e.; the e. fork of the Salmon, n.e.; and the sources of the three forks of the Boisé river, s.w. It is thus seen that the streams radiate to nearly every point of the compass from this lofty central range, yet all flow into Snake river at last. The government not yet having made a survey of this part of the territory, no map yet published (1880) gives any correct impressions of the sources or directions of the streams which flow from it. The Salmon mountains, like the Alps, are apparently without system or parallelism, and broken into a score of disjointed ranges, through which streams flow in all directions, in tortuous valleys, with intricate exits and entrances. The Wood and Salmon rivers, however, divide these mountain masses into two nearly equal parts by their valleys; Idaho having, as above indicated, a generally n.n.w. direction. The point where the two valleys head is known as the Wood river pass; is nearly 9,000 ft. high, but quite practicable for the construction of either wagon or rail road; while both valleys, to within a few miles of the summit of the pass, are easy planes for roads. These valleys and this pass are therefore the natural passage-way into the heart of Idaho. A road is just completed up the Wind river valley to within a few miles of the summit of the pass, and will probably be continued over the pass and down the valley of the Salmon to the Yankee fork before this description reaches the eye of the reader. It is at the sources of the streams that flow into these two valleys that extensive discoveries of silver and lead quartz veins, and some gold, have recently been made. The loftier parts of these mountains are generally granite or gneiss, but limestone belts are frequent, especially in the Wind river valley, and outcrops of slaty rock are found in many places.

In the northern part of the territory the Bitter-root, Kootenay, Cœur d'Alène, and Clearwater mountains may be considered as spurs of the Rocky mountain range, while the Bear river ranges in the s.e. part of the territory form connecting links between the main continental divide and the Wasatch range. The crests and summits of the Salmon river mountains, and those of the n.w. part of the territory, range from 10,000 to 13,000 ft. above the sea; those of the s.e. are somewhat lower. The most remarkable feature of Idaho connected with its mountain system is the vast lava bed which covers the whole of the territory on the s.e. and s. along the course of the Snake river; forming a desert 400 m. long, mostly on the n. side of the river, varying in width from 40 to 60 m., and exhibiting over a considerable part of that area the black and ragged character of a recent volcanic eruption. It is the eastern end of a vast volcanic belt extending westerly to the Pacific; and of the same character as the lava beds in which capt. Jack with his Indian warriors long evaded the U. S. troops in California. The volcanic craters from which all this sea of lava has been poured out are plainly indicated by the planes of the flows, though the craters themselves are generally inconspicuous among the mountains that bound the lava on the north. W.n.w. from fort Hall and Blackfoot station, on the Utah and Northern railway, are the Three Buttes, known since the first migration to the Pacific coast as landmarks on the great emigrant route which traversed this lava field near them to reach the foot-hills of the Salmon river mountains. These buttes rise, isolated, out of the lava plain, and have been volcanoes. The middle one, however, was last to spread its molten streams on every side, as proved by the descending planes of lava. It is probable that the whole northerly side of this volcanic belt was dotted with craters when the lava deposit took place, but they are now recognizable in a few places only, where last in action. After covering the great plain the lava flowed backward into the mouths of the valleys between the foot-hills on the n., so that nearly all the streams that flow e. and s.e. are dammed by the lava, and sink into its porous masses, flowing under it, to reappear after a subterranean passage from 30 to 50 m. as springs and cascades issuing from the basaltic walls of Snake river. The most rugged portion of this desert lies near the foot-hills on its northern edge. On the line of its back-flow to these hills, and up their valleys, the old emigrant road was forced to make its tortuous windings to avoid the rough lava. The lower portions of the plain nearer the Snake river, either by reason of greater age and disintegration, or by alluvial deposits upon it, are covered with soil upon which the sage-brush flourishes, and which needs only irrigation to be productive of whatever crops its elevation above the sea will permit.

Rivers.—The Snake or Shoshone river, or Lewis fork of the Columbia, with its branches, drains all the territory except the far n. and the s.e. portions. The Bear river, which flows into Great Salt lake, drains and waters a portion of the territory that admits of considerable agricultural development. The Snake rises in the main Rocky mountain range in Wyoming, entering Idaho on a n.e. course, then comes to the s. and by an irregular semicircle flows s.w., w., n.w., and n., where it divides the territory from Oregon; and thence turns westward to join the Columbia. Steamers ascend from its mouth to Lewiston, and it is navigable also from the mouth of Powder river to Salmon falls, a distance of 200 miles. It traverses a course of 850 m. in Idaho alone. Its chief tributaries from the n. side, in the territory, are the Clearwater, the Salmon, the Weiser, the Payette, the Boisé, and the Malade or Wood rivers; from the s. the Owyhee river, and a large number of smaller streams. The river from its entrance into the territory down to the falls at its southern curve is generally deep, narrow, and rapid; and can be used to irrigate large areas of adjacent lands now desert for lack of

water. Below the falls it cuts deep through beds of lava and rock. Three falls in the river deserve notice. The American falls have a perpendicular descent of 60 or 70 feet. The Shoshone falls are inferior only to those of the Niagara and the Yosemite. The river here is 600 ft. wide. Above the falls it is divided by five islands into six parts, and then, after flowing 400 yards further, it passes in an unbroken sheet over a precipice, making a perpendicular descent of 200 feet. At some seasons of the year the body of water is almost equal to that at Niagara. The surrounding scenery is magnificent. The Salmon falls, 45 m. below the Shoshone, are 20 ft. high. There are numerous other waterfalls in the territory, some of which are of greater height than those above named, though the body of water is smaller. The valleys of the tributary streams are from 3,000 to 6,000 ft. above the sea, and some of them are from 10 to 15 m. wide. The Salmon river drains a large part of the central mountains of Idaho, and flows from its source s. of lat. 44, first n.n.w., then turns due e., where it receives the Yankee fork, a small stream recently made famous by great mines, and after flowing about 50 m. e., runs n. and finally w. to the Snake. Its head-streams are numerous, and formed directly from the snows of lofty mountain ranges, so that the river is a considerable stream near its source, there flowing through a valley of rare beauty, though too elevated to have value as grazing or agricultural land. At every part of its course it is fed by mountain streams. The Boise river is made by the junction of the North, Middle, and South forks, which flow s.w. from the Saw-tooth range of the Salmon-river mountains and drop down from their sources to valleys of lower level than those of other parts of the territory; so that the s.w. part of the territory and the valley of the Boise river are the warmest, and most varied in agricultural products. Fruits and vegetables of all kinds grown in the northern states flourish there. The Weiser and Payette rivers are chiefly noted for having been the theater of some of the most successful gold placer diggings ever known. The Wood river, known where it enters the Snake as the Malade, flows southerly from sources in lat. 44° in the Salmon-river mountains. Where it issues from the mountains on the northern edge of the lava plain its detritus widens into a plain of 20,000 or more acres 5,700 ft. above the sea, which the river might be made to irrigate. The river above this descends through a narrow valley by an easy plane from its source in the pass at the head of the Salmon river. The Lemhi, the most easterly tributary of the Salmon, joins it at Salmon city, and is fed by short streams directly from the main divide of the Rocky mountains. The Clearwater is the main stream in the northern part of the territory, also known for its gold-washings. Three long narrow lakes furnish a peculiar navigation for the extreme northern part of the territory. These are the *Cœur d'Alène*, about 18 m. long and 2 m. wide, emptying by the Spokane river into the Columbia; lake *Pend d'Oreilles*, really a wide part of Clarke's fork of the Columbia river, about 30 m. long and 2 to 6 m. wide; and lake Kanisku, flowing into Clarke's fork from the mouth. These lakes are bordered by a country rich in timber, especially a large growth of red cedar.

The climate of Idaho is somewhat varied, though generally delightful during the summer and autumn. The winters in the high mountains are extremely cold, with deep snows; but in the lower valleys and plains cattle sometimes winter without shelter. In the w. part of the territory the temperature is not very different from that of central Illinois; in the e. portion it is more like that of the n. part of New England, while in the high valleys of the mountains snows rest till June. Idaho was organized as a territory by congress in 1833, but with an area more than three times as large as that embraced within its present boundaries, having included the whole of Montana and nearly all of Wyoming. It was a part of the Louisiana purchase of 1803, and formed successively a part of Oregon and Washington territories. It was first explored by Lewis and Clarke, at the beginning of the present c., previous to which time it is supposed that no white man ever set foot thereon. After that it was traversed only by hunters and trappers until 1852, when gold was discovered near the northern boundary. The total population of the territory in 1870 was 20,583, of whom 5,631 were Indians, 4,274 were Chinese, and 60 were negroes. There is no record of the population at an earlier date. Of the population forming the basis of representation (14,999), 12,184 were males, 2,815 females—7,114 native, and 7,885 foreign born. The number of families was 4,104, of dwellings 4,622. The principal tribes of Indians were the Nez Percés, 2,807 in number, living on a reservation of 1,344,000 acres in the northern portion of the territory; the Shoshones, numbering 516, and the Bannocks, 521, living on a reservation of 1,568,000 acres in the s.e. part of the territory, and about 2,000 of other tribes, on a reservation of 263,000 acres n. of that of the Nez Percés.

Mines and Mining.—Gold, silver and lead are found near the sources of nearly every river in Idaho. Gold was first discovered in 1852 on the *Pend d'Oreilles* river, but not in paying quantities till 1860, when it was washed with profit on the s. fork of Clearwater river. In 1862 valuable gold-bearing deposits were found in the streams that form the Boise river; the following year, in the tributaries of the Owyhee river; and subsequently exceedingly rich "finds" were worked in the valleys of the Weiser and Payette. This region, better known as the Boise basin, proved one of the richest placer gold-fields ever found. These and other valleys in the territory are estimated by J. Ross Brown in a report to the government to have produced prior to 1868 \$45,000,000 of the precious metals, nearly all gold. Rossiter W. Raymond, who brings the

estimate down to 1873 inclusive, gives the product of 1868, \$7,000,000; 1869, \$7,000,000; 1870, \$6,000,000; 1871, \$5,000,000; 1872, \$2,695,870; 1873, \$2,500,000: making upwards of \$75,000,000 as the total product of the precious metals in Idaho down to 1874. A U. S. assay office was established at Boise city, the capital, in 1872. From the time of the exhaustion of the gold-washings of western Idaho, the mountains of every part of the territory have been searched for silver- and gold-quartz mines. In the Owyhee valley and Boise basin many silver-mines have been worked with profit since 1872, but the difficulty of getting provisions and machinery into the mountains on the n. side of the lava-belt has seriously impeded their profitable development. In 1875-76 very valuable silver- and gold-quartz ledges were discovered on the tributaries of the Salmon river s. w. of Salmon city, the most famous of which are on Yankee fork, where Bonanza city has sprung up. The Custer mine there is remarkable for exhibiting the greatest mass of ore on the surface ever discovered. On that mine alone \$200,000 were expended in 1880 to complete and stock one stamp-mill. In 1878 rich surface-ores were found on the s. sources of the Salmon river in the Saw-tooth mountains, and mines are now being developed there. The excitement caused by that discovery led, the following year, to the exploration of all the mountains about the sources of the Salmon and Wood rivers, in which previous to that year the Indians had been feared. These explorations led to the discovery of a great number of valuable mines of silver and galena ores, especially in the tributaries of Wood river; to which wagon-roads are now (1880) being made, and which promise to secure the construction of a railway across the lava desert to the valley of the river. Four villages sprang up in those high valleys in 1880 where two years before no sound of white settler had ever been heard.

Vegetation.—The forests of Idaho are confined to the n. w. part, and to the sheltered valleys of the mountains. Noble pines, spruces, and cedars abound in the n. and in the upper valleys of the Salmon-river mountains. Trees of these species, large enough for any timber that is needed, are found here and there in all the high mountain valleys. The red cedar of Kootenay and Shoshone counties is of larger size and in greater abundance than is found elsewhere in the world. In the Boise basins, on the w. slope of the Saw-tooth range, groves of the lofty Oregon long-leaved pine abound, which attains a height of 120 to 170 ft., a diameter of 4 to 7 ft., and serves for saw-logs almost to the summit. On the e. side of the same mountain the Norway spruce and the red pine attain a diameter of 3 to 5 feet. Other pines and firs furnish an abundance of small timber there. The country e. of the Salmon and Wood rivers is meagerly timbered, and below an altitude of 6,000 ft., except the deciduous growth that fringes the streams, trees are rarely seen. Willows, poplars, and the ash-leaved maple are the principal trees at the streams. Compared with the eastern states, the vegetable growth of Idaho is extremely meager. Wild fruits are very rare in most parts of the territory. Cultivated fruits and vegetables are grown with profit in many places, but more in consequence of the high prices they command than the ease or certainty of production; though in the s. w. part there are valleys where the climate admits of a profitable culture at low price. The Boise basin is exceptionally noted for its fruits and vegetables. For grains only a small portion of the territory is adapted, yet there are broad stretches of land on both sides of the Snake river and in the valleys of its tributaries where irrigation would produce the same results in making crops of wheat, oats, and rye as it has done in Utah; and there are small tracts here and there throughout the territory where these crops can be grown without irrigation.

Of grazing-lands there are considerable tracts in the aggregate, but so scattered among mountain valleys that only a settlement of the state by the development of its mines will make the small valleys valuable. All along the n. side of the lava-belt the foot-hills and the Camus prairies furnish the thousands of cattle that pass eastward over the old emigrant road enough to live on as they travel. It is estimated that 150,000 head of cattle passed along that road in 1880. This indicates a high value for grazing during the summer; but the snow-fall at the elevation of about 6,000 feet necessitates winter feed for cattle. Along the Snake river, on both sides, there are numerous spots and valleys of grazing-lands where winters are not severe enough to prevent cattle and horses from picking up a living for themselves. Herders and packers who use mules and horses in the northern mountains through the summer season withdraw to the valley of the Snake river to winter their stock. In the n. part of the territory it is not so much the severity of the winter as the depth of the snow and shortness of the summer season that makes stock-raising of little account there.

Climate.—There is but little rain-fall in any part of southern Idaho. Towards the center the lofty mountains command a heavy snow-fall during 8 months of the year, and rob the plains of the precipitation of rain which their elevated ranges arrest. In the n. e. part the rain- and snow-fall is more equally distributed between mountain and valley. The climate of Idaho is so dependent on the elevation of its different parts that one must name each part to be described. Along the Snake river, and northward from it to the foot-hills of the Salmon and Rocky mountains, is a dry area of almost torrid heat under the sun from May till Nov.; yet the nights are always cool, and the air healthy and invigorating. The same hot sunny days are found up the lower valleys among the mountains, but there the nights are still cooler, and the warm season begins later and closes earlier. On the mountain crests the snow frequently lies all summer, and ice

forms almost every night; but even at those heights in the autumn the soil is perfectly dry to within a few feet of the melting snow. The winters are quite variable both on the plains and in the mountains, the winter variations from one year to another being greater than the summer. The thermometrical and barometrical ranges in Idaho have not been recorded to an extent that warrants any deduction or furnishes any valuable tables of reference. At fort Hall, in the s.e. part of the state, 4,754 ft. above the sea, the barometric range in 1871 from June to Oct. was but $\frac{2\frac{1}{2}}{100}$ of an inch; the mean temperature for June was 64.63° F.; of July, 70.44°; of Aug., 70.90°; of Sept., 57.29°; and of the first 18 days of Oct., 57.28°.

The wild animals of the territory include the grizzly, the cinnamon or bald-face, and the black bear, the mountain lion (a large species of panther), wolf, cayote, wildcat, raccoon, badger, fox, beaver, sable, mink, otter, skunk, gopher, squirrels, rabbit, buffalo or bison, elk, moose, mountain sheep, wild goat, and antelope. Yet of all this variety no one species abounds except in the Boisé basin. The birds are not very numerous nor of great variety; the different species of grouse being the most abundant of the game birds. Snakes, numerous in the lava belt, are rarely seen above an altitude of 6,000 feet. Many of the same species of fish are found as in the streams of the eastern states; but the variety is not so great. The great fish of the territory is the salmon, which comes up from the Columbia river in immense numbers to spawn in the Salmon and other rivers, where it attains great size, sometimes from 40 to 60 pounds. Bears stand on the margins of streams and lakes where they abound, and by a quick motion of the paw kill the salmon as they pass in the water below. Salmon fishing and packing is one of the considerable industries of the territory, and the name salmon-eater is a term of ridicule applied by miners to those who live by fishing. In a few of the interior lakes of the Saw-tooth range of mountains the red-fish is found. This is one of the rarest and perhaps the most beautiful fish in the world. Humboldt stated that in his time they were known to exist in but five lakes in the world. They have since been discovered in the Idaho lakes. It is a fish that reaches a weight of 4 or 6 lbs., but usually about 3 pounds. It is supposed to exist only where chlorine is a constituent of the water. Its anatomy and habits differ from those of any other fish. It comes to the creeks in Aug. and Sept. to spawn, and is believed to remain near the bottoms of the mountain lakes at other seasons. When these fish first appear the meat is much prized, being fat and of fine flavor; but later they become less eatable. They are caught and salted in considerable numbers in the lakes of the Saw-tooth range w. of the Salmon river.

Some interesting fossils have been found, embracing remains of the mastodon, elephant, and tapir families, of bears and monkeys, of crocodiles, alligators, and other saurians, and of genera allied to the horse. The records of the Hayden expedition are rich in details of the botany, geology, and zoology of the territory.

The census of 1870 showed 77,139 acres of farms, of which 26,603 were under tillage. The assessed value of the property for taxation in 1876 was \$4,381,227. The taxes levied for the same year, \$114,198. The debt of the territory was \$127,993. In 1870 there were in the territory 101 manufacturing establishments, with a capital of \$742,300, and disbursing in wages annually \$112,372. The annual product of these establishments, which were mostly gold and silver smelting furnaces, was valued at \$1,047,624. There was one national bank at Boisé city in 1870, with a capital of \$100,000; there were also several private banks in the territory. The schools of Idaho, like those of all sparsely settled communities with a heterogeneous population, are feeble and inefficient, though no more so than might be expected. The whole number of children of school age in the territory in 1875 was 3,852; the number attending school, 2,093. In 1876 the number in attendance was 2,724. Receipts for school purposes in that year, \$36,215.42; expenditures, \$16,590.55. The reports, however, are far from complete. Some of the schools were flourishing, and there is no lack of an intelligent public spirit to make them good in time.

The territory has but one railway, the Utah and Northern, a narrow gauge, on its eastern border, entering via the Bear river valley, coming to the Snake river at Blackfoot, crossing it at Eagle rock, traversing the lava fields n. to Pleasant valley, and thence up the Rocky mountain divide into Montana. Nearly the entire line in Idaho was built in 1878-79; and the profits of business that accumulated upon it in its progress almost built the road. A branch to the Yellow Stone park is under construction from Pleasant valley on this road. The Utah and Northern railway is owned by the Union Pacific railway company. Surveys have been made from this road at Port Neuf river and from Blackfoot westward across the lava beds to the Wood river and thence to Boisé city; also from Ogden up to the Snake river, on several lines designed to try the route of the Snake river s. of the lava field for a road to Oregon. Some one of these routes will be chosen the coming year (1881) by the Union Pacific company, and work prosecuted on it. The Central Pacific company are also contemplating the construction of a branch from Kelton, or near it, across the lava plain to the mining camps of the Wood and Salmon valleys. The recent development of mines in the interior of Idaho has stimulated the construction of wagon roads and trails; but the territory is in its infancy in this kind of work and needs the help of the government to give access to its mountain heart by roads of a better character than the poor miners can make for themselves. A

movement of great value to the miners in its mountain recesses has recently been made for the purpose of encouraging the making of toll trails for mules and horses, which can be made at slight expense at elevations on the mountain sides where wagon roads would cost more than the returns from them would warrant.

Government.—Boisé city is the capital. The governor and secretary of the state, the surveyor-general, U. S. district attorney and marshal, register of land-office, and receiver; are appointed for four years by the president; the comptroller, treasurer, and superintendent of public instruction, are elected. The legislature has a council or senate of 13 members, chosen for two years, and a house of representatives of 25 members, chosen for one year. The U. S. court for the territory consists of a chief justice, two associate judges, clerk, district attorney, and marshal. There is one delegate to congress. The territory is divided into ten counties.

IDAHO, a w. co. of Idaho territory, extending from Oregon to Montana. It is watered by the Little Salmon and other streams. Much of it is mountainous, but there are fertile valleys, especially the Payette valley, producing grain, grass, maize, and cattle. Game and fish abound. Pop. '70, 849.

IDA'LIIUM, a promontory of Cyprus, on which was a famous temple of Venus, whence the goddess was sometimes called *Idalia*. The modern name is Dali or Dalin.

IDE, GEORGE BARTON, D.D.: 1806-72; b. Vt.; graduated at Middlebury college 1830, and was pastor of prominent Baptist churches in Albany, Boston, Philadelphia, and Springfield, Mass., 42 years. He was distinguished for eloquence and erudition. Several of his sermons were published.

IDEALISM (*IDEA, ante*), as the term is generally used, is that scheme of philosophy which, carried to its legitimate results as was done by bishop Berkeley, regards all external phenomena as having no existence apart from a thinking subject. Descartes and his followers taught that nature has given to the mind various simple ideas, with the capacity also of compounding, separating, associating, and comparing them. The tendency of this theory is towards skepticism concerning everything except the existence of ideas. If they be the only objects of thought, and have no existence except when the mind is conscious of them, then no object of thought can have a continued and permanent existence. Bishop Berkeley, evading this consequence in regard to the existence of mind and spirit, asserted it concerning the material world. He maintained that there is no such thing as matter in the universe; that sun and moon, earth and sea, our own bodies and those of our friends, being only ideas in the minds of those who think of them, have no existence when not objects of thought; and that the universe may be reduced to two categories—minds, and ideas in the mind. To this conclusion philosophers before him had led the way. Descartes taught that the existence of objects of sense is not self-evident, but must be proved by argument. Others tried to find arguments that would prove it, but without entire success; all their reasoning being, in the opinion of many, sufficient only to show that the existence of external things was probable but not certain. Malebranche rested the question on the authority of revelation; but to this the reply was that revelation itself can come to men only through their senses. Berkeley thought that if his theory were admitted many difficulties would be solved, many intricate points made plain, and skepticism brought to an end. But the actual result of his system was very different. By seeming to throw distrust on the evidence of the senses and to take away the grounds of a belief which is both natural and universal, its tendency was to shake men's faith in the primary truths which are the basis of their knowledge and the guides of their conduct. Beginning where Berkeley began, Hume went much further, and left hardly one article of human faith unassailed. He denied the reality not only of the object perceived, but of the mind perceiving; and reduced all thinking existence to a succession of rapidly fleeting ideas, each one being known only at the instant of its manifestation to consciousness, and then fading away. He maintained that men do not know that any one thing depends on any other in the relation of an effect to its cause; and the conclusion at which his reasoning aimed was not the mere negation of this or that positive belief, but universal distrust of the human faculties as a means for the acquisition of knowledge. They contradict each other, he said, and leave nothing certain except that nothing can be known as certain.

Idealism has indeed its interwoven truth, but it is a truth misapprehended and perverted. There are impressions, inferences, and imaginations, mingling, naturally or inadvertently, lawfully or unlawfully, with all genuine knowledge. These the ideal philosophy confounds, instead of distinguishing them in theory as common sense does in practice. As a system its radical vice is that while it admits the reality of certain objects, as mind and spirit, it inconsistently maintains that certain other things, as those of the material universe, which the mind just as intuitively knows to be real, are not real. It commonly begins by declaring that external objects have no such reality as men generally suppose them to have; advancing, from this point, to the denial that they have any reality at all, it still makes pretensions to a realism founded, not on the external phenomenon, but on the internal idea. From this refuge also logical necessity drives it away and forces it to assert that *self* is not as it seems, or that it exists only as it is felt, or when it is felt, and that men cannot know whether there be objects before them or not, or whether there be an eye or a mind to perceive them. There is no way

of avoiding blank skepticism except by standing up for the trustworthiness of all the original intuitions of the human mind and affirming that there is a reality whenever those intuitions, taken comprehensively, actually declare that there is. If the mind can trust the faculties God has given it, it does perceive matter objectively; that is, something extended and solid is the immediate object of touch and sight; and this something is not in itself an idea, but matter.

IDIOCY (*ante*). The great distinction between idiocy and that form of insanity called dementia is that the latter is acquired, comes on in an individual who has had rational faculties, and therefore has vestiges of previously formed ideas; while the brain of the idiot is a blank, and of a kind which can scarcely be made to receive an impression until some further organic development is effected. The demented person, as the name implies, has lost a part of his mind, but the idiot is in a state of amentia, a term which strictly applies not to the demented condition produced by disease or feebleness, except when the dementia is complete. Want of organization, or defective development, is the cause of idiocy, and this defect is apt to be accompanied by dwarfishness, and more or less apparent malformation and grotesqueness, and the defects are often so great that little or no mental structure can be erected, very little more, indeed, than the simplest habits, and these to a great extent connected with the promptings of the senses. The causes of idiocy are various. Its elements are no doubt hereditary, that is to say, a course of conduct in a parent which tends to degeneration, such as excessive sensual indulgence of any kind, will tend to induce arrested development in offspring. Residence in certain localities, as the lower valleys of the Alps, appears to favor arrest of cerebral and bodily development—according to Virchow—in consequence of the great amount of lime drank with the water. The attempt to educate idiots commenced in the 17th c., with an experiment of St. Vincent de Paul at the priory of St. Lazarus. His efforts to teach idiots, though continued for many years, were not successful. In 1799 the celebrated Itard took a wild boy, found in the forests of Aveyron and attempted to teach him; and although the success in this particular case was slight, he believed that he had discovered methods and facts which would be of use in other cases. These he communicated to his pupil, Dr. Seguin, who, in 1838, opened a school for idiots in the hospital for incurables at Paris. He met with success enough to have the idiots at the Bicêtre sent to the hospital to be instructed, and in the course of three years he received the approval of the French academy. Dr. Seguin adopted a system involving the theory that idiocy was prolonged infancy. His practice, founded upon this, was to excite and continue the process of development. Of course a variable success attended the experiment. The art of effecting such development requires much knowledge, tact, and patience. Different kinds of idiots need different stimulants, physical and mental. Pure air, good nutritious food, exercise; in short, any treatment which is calculated to increase the bodily and mental functions will improve the idiot. Wherever his interest can be awakened there will be a mental stimulus, and as the tendency of development is toward a normal standard, more or less improvement must follow. Of course the same amount of care expended upon healthy and normal children would show much greater results; and the most that can be expected in the education of idiots is to make them as comfortable and as cheerful as circumstances will allow. It might indeed be possible, by continuing the education of idiots through many generations, to raise them to an approach to the normal primitive standard of manhood, but the difficulties would be great.

According to the census of 1870, which is the latest authority obtainable at the present time, Nov., 1880, the number of idiots in the United States was 24,477, distributed among the States as follows:

Alabama.....	721	Maryland.....	362	Rhode Island.....	123
Arkansas.....	289	Massachusetts.....	778	South Carolina.....	463
California.....	87	Michigan.....	613	Tennessee.....	1,091
Connecticut.....	341	Minnesota.....	134	Texas.....	451
Delaware.....	69	Mississippi.....	485	Vermont.....	325
Florida.....	100	Missouri.....	779	Virginia.....	1,130
Georgia.....	871	Nebraska.....	25	West Virginia.....	427
Illinois.....	1,244	New Hampshire.....	325	Wisconsin.....	560
Indiana.....	1,360	New Jersey.....	436	District of Columbia.....	50
Iowa.....	533	New York.....	2,486	New Mexico.....	46
Kansas.....	109	North Carolina.....	976	Utah.....	23
Kentucky.....	1,141	Ohio.....	2,338	Other Territories.....	15
Louisiana.....	236	Oregon.....	55		
Maine.....	623	Pennsylvania.....	2,950	Total.....	24,477

But this number falls below the reality, and for various reasons. Parents are often unwilling to admit or to believe that their children are idiots, and often present them to physicians and asylums for treatment for "strangeness of manner," etc. The degrees and forms of idiocy are also various, and not easily recognized by an unprofessional person; thus many escape being put in the list by the census taker. The number of idiots in England, Ireland, Scotland, and Wales was estimated according to the census of 1871 to be 39,452, but it has been thought by competent authorities to be over 50,000. In Switzerland the number of idiots is estimated to be about 4,000. See **CRETINISM**.

IDOMENEUS, a Greek who succeeded his father, Deucalion, as ruler of Crete, called also Lyctius and Cnossius, from the Cretan towns Lyctus and Cnossus, of which he is said to have been a native. He accompanied the Grecian fleet with 80 ships to the Trojan war, where he was distinguished for valor. It is said that, overtaken by a tempest on returning, he vowed to Neptune that if saved he would sacrifice to him the first living thing that met him on the Cretan shore. It was his son who appeared, and he fulfilled his vow, but for his cruelty was banished by his subjects. Sailing to Italy, he founded a city in Calabria, and built a temple to Minerva. From Calabria he went to Colophon, where he died.

IESI. See **JESI**, *ante*.

IFFLAND, **AUGUST WILHELM**, 1759-1814; b. in Hanover, Germany. At the age of 18 he appeared upon the stage at Gotha; in 1779 he acted in Mannheim; in 1796 was made the director of the National theater at Berlin; and in 1811 appointed general director of the royal plays. He wrote many dramas, which were very popular at the time, and several volumes of them have been published.

IF'URIN, the *hades*, or infernal regions of the ancient Gauls, as described in Celtic mythology. A vivid imagination invested the locality with objects of terror, including wild beasts, the mythical dragon, venomous serpents, and an atmosphere impregnated with deadly poisons enveloping the whole. Here the unfortunate, condemned to sustain its tortures, was doomed to eternal misery.

IGASU'RINE, a very poisonous alkaloid, occurring in *nux vomica* with strychnine and brucine. The word is derived from the Malay *igasura* (vomiting nut).

IGLESIAS, a walled t. of the island of Sardinia, in the province of Cagliari; pop. about 5,000. It is well watered by springs, and corn, wine, and fruits are produced in the surrounding country. In its vicinity are silver and other mines, and the mining operations are prosperous. It has numerous churches, including a cathedral, a fine Episcopal palace, a Jesuits' college, and several convents.

IGLESIAS, **JOSÉ MARIA**, b. Mexico, 1822. An eminent orator and statesman of the Mexican republic. Before reaching his majority he occupied the chairs of arts and modern languages, respectively, in the colleges of San Gregorio and San Ildefonso, in the city of Mexico. He entered politics as a young man, and speedily attracted attention for his remarkable natural ability. Political preferment rewarded his loyalty to the government, and in 1857 he was a cabinet minister. In 1868 he was a member of the general congress, and the same year was appointed minister of the interior by Juárez, to whose fluctuating fortunes he had clung with unswerving fidelity. In 1873 he became president of the supreme court of justice.

IH'LANG-IH'LANG, a strong and rich perfume from a fine forest-tree of the Philippine and Malay islands, the *unona odoratissima*. The perfume is distilled from a volatile oil yielded by the flowers, and is valued at about \$250 a pound.

ILEUM (*ante*), the lower and longer portion of the small intestine, so called because of its numerous convolutions and twists and windings (Gr. *εἰλεῖν*, to twist). It terminates below in the cæcum, the lower sac-like portion of the large intestine called the colon. The other and upper portion of the small intestine lies between the ileum and the stomach, and consists of the duodenum and the jejunum (q.v.), the latter being next above the ileum, while the duodenum is that portion immediately below the stomach, and is larger in diameter than either jejunum or ileum. The duodenum is about 10 in. long, the jejunum about 6 ft., and the ileum about 12 ft., or about two-thirds of the whole of the small intestine, and it principally occupies the hypogastric and right iliac regions of the abdomen. See **REGIONS OF THE BODY**. It is the principal seat of enteritis, or inflammation of the mucous coat of the small intestine (Flint), and also the principal seat of lesion in typhoid fever (q.v.), in which the glands of Peyer become inflamed and ulcerated.

ILIJATS'. See **ILIYATS**.

ILINIZA, or **ILINISSA**, a volcano of the Cordilleras in Ecuador, South America, 10 m. s. of Quito. There are two peaks, 17,380 ft. high, visible from a great distance at sea.

ILION, a village of Herkimer co., N. Y., in the town of German Flats, on the s. bank of the Mohawk river, and on the Erie canal; pop. '70, 2,876. Horse railroads connect it with Mohawk and Herkimer. It was incorporated 1865. It has two weekly newspapers, and large factories for fire-arms, sewing-machines, and agricultural implements.

ILIUM (*ante*), a portion of one of the bones of the pelvis, the os innominatum. In the undeveloped child it is a distinct portion, which afterwards becomes united to the pubis in front and to the ischium behind and below. It is the hip-bone or haunch-bone. The word has the same derivation as ileum (q.v.). Some suppose that the root

εἰλεῖν refers to the curving or winding of the crest of the ilium, and that the latter does not get its name because it partly supports the intestine ileum.

ILIYATS, or EELIYATS, a nomadic tribe of Persia and Turkistan, mostly of Turkish, Arabic, or Kurdish descent. They are Mohammedans of the Sunni sect. They have no settled abode, but live in tents, moving from place to place, according to climate or season. They have large flocks and herds, and some tribes live by plunder. Each tribe pays tribute in cattle for the use of grazing ground, money not being known among them.

ILLINOIS (*ante*), is the eighth state admitted to the union under the federal constitution, and by the census of 1870 the fourth in population; of 1880, the same. It lies between lat. 36° 59' and 42° 30' n., and long. 87° 35' and 91° 40' w.; extreme length n. and s., 385 m.; extreme breadth e. and w., 218 m.; area, 55,410 sq. m., or 35,462,400 acres. Its name is derived from its principal river, and is of mixed Indian and French derivation. The first white settlements in the state were made by the French from Canada, who followed the explorations of Marquette and La Salle. The latter, having crossed the lakes in 1679, descended the river which he named Illinois and built a fort at the foot of lake Peoria, a broad expansion of the stream for a distance of some 25 m. about midway in its course through the state. After descending the Mississippi for some distance he returned to Canada, but came again in 1682 with a colony, and founded Kaskaskia, Cahokia, and some other towns. These settlements, early in the 18th c., were visited by Jesuit missionaries, who described the country as a new paradise. The colonists were on the most friendly terms with the Indians, and finally degenerated to their level. In 1763 Canada and the whole American territory e. of the Mississippi passed under British control, but the Illinois settlements were not disturbed. After the peace of 1783 the Illinois country was ceded to the United States, and in 1787 the whole national domain n. of the Ohio was organized under the name of the North-west territory, by an ordinance which protected it forever from the inroads of slavery. In 1800 this immense territory contained only a little more than 50,000 inhabitants. In the same year Ohio was organized as a separate territory; in 1805 Michigan was set apart in the same way; and in 1809 the territory of Indiana was organized. What remained of the original North-west territory was soon organized under the name of Illinois. It embraced, besides the state itself as at present bounded, Wisconsin and part of Minnesota, and contained a white population of a little over 12,000. The Indians at this time were very troublesome, and the settlement of the territory was consequently much impeded. After the close of the war of 1812 Indian hostilities ceased, and the territory began to be occupied by emigrants from the eastern states. In 1818 Illinois, with its present boundaries, was admitted to the federal union as a state. The census of 1820 reported the population to be 55,211; that of 1830 showed it to be 157,445. In 1831 there was further trouble with the Indians, which culminated in the Black Hawk war and the removal of all the Indian tribes from the state. After this the population increased rapidly, congress made an appropriation for the improvement of the harbor of Chicago, and the construction of the Illinois and Michigan canal was begun. In spite of the financial revulsion of 1837, the effects of which upon the new state were of the most serious character, the census of 1840 showed a population of 476,183, a gain of 318,728 in ten years. In 1840 the Mormons settled at Nauvoo, intending to make it their "Jerusalem." Their doctrines and practices were very distasteful to their neighbors, and a great excitement was the result. Joseph Smith, the founder of the sect, and his brother Hyram, were arrested and put into jail at Carthage for destroying a press established by a party of Mormons to oppose polygamy. They refused to submit to an arrest by the civil officer, and the sect, numbering 20,000 people, organized for their protection. They finally surrendered to the military, but the public mind had now become so inflamed that, before they could be tried, the jail was invaded by a mob and they were killed. The sect soon afterwards removed to Utah. The population of the state in 1850 had increased to 851,470. The grant by congress of extensive sections of the public lands to aid in the construction of the Central railroad, which was completed in 1856, had the effect of drawing multitudes of people to the region through which it passed, and of building up many flourishing towns and villages, and in the course of a few years every acre of government land in the state was sold. Kaskaskia was the territorial capital; the state capital from 1818 to 1836 was at Vandalia. At the last mentioned date it was removed to Springfield, where it has since remained.

The streams of Illinois, with the exception of a few short ones in the n.w. part of the state, which empty into lake Michigan, find their way directly, or indirectly, to the Mississippi. The largest river wholly within the state is the Illinois, which is formed by a junction of the Des Plaines from Wisconsin and the Kankakee from Indiana, and flows nearly 500 m. before reaching the Mississippi. It is navigable for 245 m. from its mouth. The Chicago river, which formerly emptied into lake Michigan, now flows out of that lake by an artificially defined channel into the northern branch of the Illinois. The chief affluents of the Illinois are the Fox, Spoon, and La Main rivers, and Crooked creek from the n. and w., and the Vermilion, Mackinaw, and Sangamon rivers, and Macopin creek from the s. and east. The Kaskaskia rises in Champaign co. and runs parallel to the Illinois

for 250 m., flowing into the Mississippi near the s. border of Randolph county. Rock river, which rises in Wisconsin, flows through the n.w. portion of the state, and enters the Mississippi at Rock Island. The Wabash, which divides the state from Indiana on the e. for a considerable distance, receives the waters of the Big Vermilion, Embarras, and Little Wabash, and flows into the Ohio in Gallatin county. The Big Muddy, an affluent of the Mississippi between the Ohio and the Kaskaskia, drains a considerable extent of territory. The surface of the state is a gently inclined plane descending from the n.e. in a s.w. direction toward the Mississippi. With the exception of a low ridge extending across the southern end of the state, there is not a single elevation that can be properly called a mountain. In the north-western corner, where there are extensive deposits of lead, the surface is broken into small hills, and there are bluffs on the Mississippi and Illinois rivers, which, in contrast with the prairies, present a picturesque appearance. The largest portion of the state consists of level or gently undulating prairies, with a rich and deep soil. Geologists think that anciently the waters of the great lakes flowed into the gulf of Mexico through the channels of the Illinois and the Mississippi. It is also conjectured, from the diluvial character of the soil, that the larger portion of the surface of the state was once the bed of an immense lake. The loam and mold which form the surface are underlaid by an almost solid bed of clay which prevents the moisture from wasting. In the river bottoms the mold is sometimes more than 25 ft. deep, and of inexhaustible fertility. In almost every part of the state the plow is never obstructed even by a pebble. Over these extensive prairies, in their wild condition, once roamed innumerable herds of buffaloes, which fattened upon their rich vegetation. The prairies are generally interspersed with islands of oak and other forest trees, and there are occasional wooded belts where the limestones and sandstones above the coal formations come to the surface.

The state has an immense field of bituminous coal, 375 m. in length and 200 m. in breadth, which furnishes a supply of fuel sufficient not only for home use, but for extensive exportation, so that the demand for wood is limited. But for this abundance of coal the state must ere now have been utterly denuded of her forests. The trees most abundant are oak, black walnut, sugar maple, ash, locust, elm, hickory, linden, persimmon, pecan, cottonwood, sycamore, buckeye, tulip, poplar, beech, and black birch. Yellow pine, cypress, and cedar are found near the Ohio river. The iron ores are of an inferior quality, but are sometimes utilized by mixing them with those brought from Missouri and Lake Superior. Lead, with a mixture of silver, is found in Joe Davies co., in the n.w. corner of the state, and is mined extensively. Veins of copper ore are found in the n. part of the state, and worked with profit. Zinc also is found in the same quarter. Limestone of good quality for building and burning, and freestone, marble, and gypsum, are found in some places. Salt springs exist in Jackson, Vermilion, and Gallatin counties, and sulphur and chalybeate springs in Jefferson county. In Hardin co., on the Ohio river, is a cave 80 ft. sq. and 25 ft. high, which in the early days of this century was the resort of criminals and outlaws.

Many of the wild animals have been exterminated. Few deer are left, and bears, panthers, and wildcats are rare. The prairie wolf is sometimes met with in sparsely settled regions, and foxes, hares, and squirrels are numerous. Game-birds, such as the wild turkey, prairie-hen, and grouse, are plentiful. Fish of good quality and in considerable variety are found in the rivers and lakes. The insect tribes are numerous, and a few of them are injurious to vegetation. The climate of the state varies with the degrees of latitude. In the n. the summer heat is intense, the winter cold severe. There being no mountains to break the force of the winds they are very cutting in the cold season, while the summer heat is mitigated by them. The atmosphere is rarely in a calm condition. In the extreme n. part of the state the mean annual temperature is $47\frac{1}{2}^{\circ}$, while in the extreme s. it is $58\frac{1}{2}^{\circ}$, and in the center 54° . The climate, except in the low swampy bottom lands, where bilious and intermittent fevers prevail, is exceedingly favorable to health. The proportion of clear to cloudy or rainy days is a little more than two to one.

As an agricultural state Illinois stands in the first rank. It contained in 1870 10,329,952 acres of improved and 6,552,909 of unimproved land; and, of the unimproved lands, 1,491,331 acres were wooded. Total number of farms at the same date, 202,803; of which 302 contained 1000 acres or over; 1367 from 500 to 1000 acres; 65,940 from 100 to 500 acres; 68,130 from 50 to 100 acres; and 53,240 from 20 to 50 acres. The estimated total value of these farms was \$920,506,346; of agricultural implements, \$34,576,546; of farm products, \$210,860,585; of orchard products, \$3,571,789; of market gardens, \$765,992; of animals sold for slaughter, \$56,718,944; of home manufactures, \$1,408,015; of forest products, \$1,087,144; total, \$1,379,252,100—an immense result for a state which, 70 years before, had only a little more than 12,000 inhabitants. In 1873 the value of the cultivated lands was estimated at \$1,600,000,000; the actual property of the state, real and personal, at \$2,800,000,000. The chief productions are wheat, corn, rye, oats, barley, flax, buckwheat, potatoes, sweet potatoes, tobacco, peas, beans, wool, cheese, hops, maple sugar, honey, and every variety of garden vegetables. The state in 1870 exceeded all others in the Union in the product of wheat, corn, and oats. It contained more swine and horses than any other state, and was exceeded by only New

York in the aggregate value of its live-stock. The wheat crop of 1879 was estimated at 45,417,661 bush., valued at about \$40,000,000. The corn crop of the same year was 54,664,569 bush., valued at \$12,059,162.

In manufactures, by the census of 1870, Illinois ranked sixth among the states; in the value of the products of butchery, distilled liquors, planed lumber, and pork packing, she stood before all others. The number of her manufacturing establishments was 12,579; persons employed therein, 82,979, of whom 73,045 were men, 6,717 women, and 3,217 children; capital invested, \$94,368,057; wages paid, \$81,100,244; annual product, \$295,620,672. The number of flouring-mills was 681; capital invested in them, \$12,931,600; persons employed, 3,581; wages paid, \$1,704,778; value of products, \$39,413,618. Next in importance was the business of packing pork and other meats, the capital invested in which was \$6,921,000; persons employed, 2,236; wages paid, \$448,560; value of products, \$19,818,851. In the manufacture of malt and distilled liquors 1955 persons were employed; wages paid, \$1,031,142; capital invested, \$7,397,900; value of productions, \$12,042,976. The value of the lumber produced was \$11,382,649; of agricultural implements, \$8,880,390; iron wares, \$7,738,443; clothing, \$8,407,005; carriages and wagons, \$6,019,291; machinery of all descriptions, \$6,398,794; tobacco in its various forms, \$4,319,716; leather, \$4,148,163; woolen goods, \$2,725,690; printing and publishing, \$2,727,549; furniture, \$2,982,532; coopering, \$2,501,531; boots and shoes, \$2,298,136; oils, animal and vegetable, \$2,642,733; saddlery and harness, \$2,581,416; sashes, doors, and blinds, \$2,316,320; tin, copper, and sheet-iron wares, \$2,194,812; confectionery goods, \$1,948,710; bakery products, \$1,732,885; bricks, \$1,638,764; marble and stone work, \$2,098,209; soap and candles, \$1,250,930; grease and tallow, \$1,412,900; paper, \$1,188,400; railroad cars, \$1,010,007.

The railroads of Illinois are more numerous and of a greater extent of track than those of any other state in the union. This is owing in part to the favorable situation of the state for commerce and travel, and partly to its almost level surface, which reduces the cost of construction to the lowest point. The total number of miles of railroad track in the state in 1874 was 6,116, occupying a space of nearly 60,000 acres, and valued, with right of way and improvements, at more than \$40,000,000. The cost of equipping these roads is estimated at nearly \$241,000,000; amount of preferred stock, \$17,812,000; amount of common stock, \$131,472,000; of bonded debt, \$125,000,000; of floating debt, \$4,180,000; gross earnings for the year, \$43,188,000; operating and general expenses, \$29,521,000; excess of earnings over expenses, \$13,474,000; freight carried, 10,148,427 tons; number of passengers, 11,464,217. The most important of these roads, with their length in miles, are the following: the Illinois Central and its branches, 705; Chicago and Alton and branches, 548; Chicago, Danville and Vincennes, and branches, 783; Chicago, Rock Island and Pacific, 181; Cairo and Vincennes, 156; Indianapolis, Bloomington, and Western, 131; Indianapolis and St. Louis, 186; Ohio and Mississippi, 147; Rockford, Rock Island, and St. Louis, 318; St. Louis and Southeastern, 180; Springfield and Illinois Southeastern, 221; St. Louis, Vandalia, and Terre Haute, 158; Toledo, Peoria, and Warsaw, 230; Toledo, Wabash, and Western, 386; Western Union, 127. The Illinois Central pays to the state 7 per cent of its gross earnings, amounting to over \$50,000 per annum, and is not otherwise taxed. The other roads pay taxes upon their assessed valuation. The companies are required to make written reports under oath, at stated intervals, and to obey the rules as to reasonable maximum rates of fare and of freight prescribed by commissioners appointed by the state.

In 1874 the debt of the state amounted to \$1,706,750; indebtedness of some of the counties, cities, and towns, represented by outstanding railroad bonds, in 1870, \$13,500,000; other indebtedness of counties, cities, and towns, \$37,300,000. The commercial facilities of Illinois are scarcely rivaled by those of any other state. The Mississippi washes its whole w. boundary, while the Wabash and Ohio are navigable on one-half the e. and the whole of the s. boundary; the Michigan and Illinois canal, 100 m. long, connects lake Michigan, through the Chicago and Illinois rivers, with the Mississippi; while numerous railroads open the way for freight and passengers from every part of the state to the northern lakes and the Ohio and Mississippi rivers. The traffic through these channels is immense, and there are no recent statistics that give an approximate idea of its amount. Large quantities of Illinois production go to swell the commerce of St. Louis, Indianapolis, Louisville, and Cincinnati, while vast amounts are shipped directly and without breaking bulk to Boston, New York, Philadelphia, Baltimore, New Orleans, and San Francisco. The foreign commerce of the state, which is rapidly increasing, is chiefly carried on through the port of Chicago. There were in the state in 1874, 152 national banks with a capital of \$20,338,670. There were also 12 state and savings banks doing a discount and deposit business, with a capital of \$3,300,000, and 217 private banks. The insurance companies were mostly ruined by the Chicago fire of 1871, but new ones are rapidly taking their places. In 1873 eight new companies were in operation, with an aggregate capital of nearly \$2,000,000, and assets amounting to \$2,568,000. There were besides at the same time 6 life-insurance companies—all in Chicago—having an aggregate capital of \$1,800,000, and assets amounting to \$3,355,000. In 1879 the number of fire, marine, and inland insurance companies was 171. The state is as well supplied with

telegraphs as with railroads, the lines extending in the aggregate more than 10,000 miles.

The census during four decades before 1840 showed the presence of a few slaves, introduced by emigrants from the southern states in defiance of the ordinance of 1787. Efforts were indeed made here, as in Indiana and Ohio, to treat that ordinance as a dead letter, and give slavery a foothold n. of the Ohio river, but they proved abortive. The pop. of Illinois in 1870 was 2,539,891, of which 2,024,693 were natives of the country, 515,198 of foreign birth, and 28,762 were colored; males, 1,316,537; females, 1,233,354. The charitable and correctional institutions of the state are: the penitentiary at Joliet, which has usually from 1200 to 1400 inmates; the reform school at Pontiac, with accommodations for but 150 inmates, too small for the public needs; the institutions for the deaf and dumb and the blind, at Jacksonville; the charitable eye and ear infirmary at Chicago; insane asylums at Jacksonville, Elgin, and Anna; the institution for the feeble-minded at Jacksonville; and the home for children of deceased soldiers at Normal. These institutions are under the supervision of a state board of commissioners, appointed by the governor with the consent of the senate. The public-school system is well organized and efficient. Appropriations of public money for sectarian schools are forbidden in the constitution. Every school district is required to maintain a free school during five months of every year, the tax for which is limited to 2 per cent for educational and 3 per cent for building purposes upon the assessed value of its taxable property. The elements of natural science are required to be a part of the common school course. Teachers are required to produce a certificate of competency from the county superintendent. The amount of the state school fund in 1872 was \$12,764,495. The total income from this fund and from the current school funds was \$7,500,122. The income from current funds was derived chiefly from the two-mill tax and the ad-valorem tax in the districts—\$900,000 from the former, and \$5,292,942 from the latter. The number of school districts in 1872 was 11,231; of public schools, 11,376, of which 88 were high and 611 graded; number of teachers—male, 9,094; females, 11,830; average monthly salaries of teachers—males, \$50; females, \$39; total approximate value of school property, \$19,876,708; number of volumes in district libraries, 54,286; number of private schools, 436, with 34,784 pupils. The number of persons in the state unable to read and write was 6,753. The state normal university at Normal for training teachers comprises, besides the usual departments, a model school. It employs from 12 to 15 instructors, and usually contains from 700 to 800 pupils, a large proportion of them in the model school. There is another normal university at Carbondale, in the s. part of the state, and, besides the two state institutions, there are county normal schools in Cook, Peoria, and Joe Daviess counties. In 1879 a law was enacted to enforce the attendance at school for at least 12 weeks in each year of every child between the ages of 8 and 14. According to the census of 1870 Illinois had 26 universities and colleges, with 223 instructors and 4,657 students; 32 academies, with 201 instructors and 1,690 pupils; 2 law schools, with 3 instructors and 61 students; 2 medical schools, with 19 instructors and 358 pupils; 9 theological schools, with 28 instructors and 555 students; 2 schools of agriculture, 2 of commerce, and 2 of art and music. There were in 1873 9 institutions for the superior instruction of girls, all but one under the patronage of some religious denomination; 2 of these are Roman Catholic, 2 Methodist, 2 Presbyterian, 1 Baptist, and 1 Congregational. The number of medical schools in 1873 was 6, with 89 instructors and 603 students; one of these schools was homeopathic. The theological schools in 1873 were of the following denominations: 2 Presbyterian, 2 Baptist, 1 Methodist, 1 Congregational, 1 Protestant Episcopal, 1 United Presbyterian, 1 Christian, and 1 Lutheran; instructors, 48; students, 260. The number of libraries, private and public, as reported by the census of 1870, was 13,570, containing 3,323,914 volumes. The Chicago fire of 1871 destroyed the largest of these libraries. The number of newspapers and other periodicals in 1870 was 505, circulating 113,140,492 copies annually. Of these publications, 39 were daily, 10 tri-weekly, 4 semi-weekly, 364 weekly, 11 semi-monthly, 72 monthly, 2 bi-monthly, and 3 quarterly. The religious organizations in 1870 numbered 4,298, having 3,459 church edifices, and property valued at \$22,664,283. The leading denominations are: Baptist, Christian, Congregational, Episcopal, Friends, Jewish, Lutheran, Methodist, Presbyterian, Roman Catholic, United Brethren in Christ, Unitarian, and Universalist.

The present constitution of Illinois was adopted in 1870. The senate consists of 51 members, elected for 4 years; the house of representatives of 153 members, elected for 2 years. The legislative sessions are biennial. The governor and other executive officers (except the treasurer) are elected for 4 years, and cannot serve for two consecutive terms. The judicial department is composed of a supreme court, circuit courts, county courts, justices of the peace, and police magistrates. The supreme court, including the chief justice, is composed of 7 justices, each of whom is elected by the people of a judicial district for a term of 9 years. The chief justice is chosen by his associates. The circuit judges are elected for 6 years, the county and probate judges for 4 years. Voters must have resided in the state one year, in the county 90 days, and in the election district 30 days next preceding an election. The electoral votes of Illinois for president and vice-president have been cast as follows: 1820, 3 for Mon-

roe and Tompkins; 1824, 2 for Jackson and 1 for Adams for president, and 3 for Calhoun for vice-president; 1828, 3 for Jackson and Calhoun; 1832, 5 for Jackson and Van Buren; 1836, 5 for Van Buren and R. M. Johnson; 1840, 5 for Van Buren and Johnson; 1844, 9 for Polk and Dallas; 1848, 9 for Cass and Butler; 1852, 11 for Pierce and King; 1856, 11 for Buchanan and Breckinridge; 1860, 11 for Lincoln and Hamlin; 1864, 16 for Lincoln and Johnson; 1868, 16 for Grant and Colfax; 1872, 21 for Grant and Wilson; 1876, 21 for Hayes and Wheeler; 1880, 21 for Garfield and Arthur.

ILLINOIS, the name of a community of tribes of Indians, partly belonging to the great Dakota family, and inhabiting the territory which afterwards became the state of Illinois, and also lands w. of the Mississippi. They included the Kaskaskias, Peorias, Tamaroas, Moingwenas, Cahokias, and Michigameas, principally Algonquians. They were a warlike race, aided the French in their Indian wars, and fought the Sacs and Foxes on their own account. Only a remnant of this family exist, on reservation in the Indian territory.

ILLINOIS COLLEGE, at Jacksonville, Morgan co., Ill., was organized by Congregationalists as a non-sectarian institution in 1830. It has a library of 10,000 volumes. Number of professors in 1878, 9; number of students, 87.

ILLINOIS INDUSTRIAL UNIVERSITY, at Urbana, Champaign co., Ill., was organized in 1868, its chief endowment being derived from the public lands which fell to the share of the state of Illinois under the act of congress of July 2, 1862, and which were to be devoted to the establishment of colleges of agriculture and the mechanic arts. This endowment amounts to \$320,000, and the university has 25,000 acres of land still unsold, valued at from \$5 to \$10 per acre. Its annual income, derived from endowments, fees, and state appropriations, amounts to about \$75,000. Its grounds, including the military campus, the college campus, and the farm, orchards, gardens, nurseries, arboretum, etc., embrace 623 acres. The main college building is one of the largest and best of its kind in the country, being four stories high and 214 ft. long, with a depth on the wings of 122 feet. It contains an auditorium, library, museum, art gallery, physical laboratory, and over thirty lecture-rooms. Besides this there are one large and two small dormitories, a large mechanical and military building, a large chemical laboratory, a green-house, and several farm houses and other farm buildings. The chemical laboratories contain desks and apparatus for 200 students; the physical laboratory has accommodations for 50 students; and there is besides a laboratory for students in mechanical engineering and architecture. There is a large museum of natural history, including zoological, geological, and mineralogical cabinets, agricultural and horticultural cabinets, collections for illustrations in mechanical and civil engineering, and a fine-art gallery, embracing over 400 casts of celebrated sculptures, a large collection of photographs and engravings from celebrated paintings, and a gallery of historical portraits. The library in 1880 included about 12,200 bound volumes and nearly 2,500 pamphlets. The corps of instructors at the same date included 17 professors, and 10 teachers and assistants. Number of students, 599; alumni, 227. The university is organized in four departments, viz.: literature and science, engineering, natural science, and agriculture. These embrace respectively the schools of ancient, English, and modern languages; mechanical, civil, and mining engineering, and architecture; chemistry, natural history, domestic sciences, and agriculture and horticulture. Women are admitted to all the courses of study. Military training, heretofore given to all male students, is hereafter to be confined to those of the first two years. There is a gymnasium for men and a calisthenic hall for women. J. M. Gregory, LL.D., regent, resigned in 1880, and S. H. Peabody, PH.D., is the acting regent.

ILLINOIS AND MICHIGAN CANAL, an artificial navigable water-course connecting lake Michigan and the navigable waters of the Illinois river, and allowing of the passage of vessels from the gulf of Mexico to the gulf of St. Lawrence by using also the Welland canal, which forms a navigable channel from lake Erie to the St. Lawrence river. In 1825 it was estimated that the canal, about 100 m. in length, would cost about \$700,000. In 1833 new surveys and estimates were made placing the cost of a canal 40 ft. wide and 4 ft. deep at \$4,043,000; but nothing definite was attempted till 1836, when the plan was altered and estimates were made for a canal 60 ft. wide at the surface, 36 ft. at the bottom, and 6 ft. deep, costing \$8,654,000. Work was commenced in June, 1836, and continued till Mar., 1841, when it was discontinued for want of available funds. In 1845 an additional \$1,800,000 was raised by the sale of lands owned by the canal. It must here be stated that in consequence of a change of plans the entire cost fell within the estimates which had been made, so that at the opening of the canal in April, 1848, the entire expenditure had been \$6,170,226. When completed the eastern terminus joined the s. branch of the Chicago river, five m. from the mouth of the main stream. A direct line is pursued to the valley of the Des Plaines, the main eastern branch of the Illinois river, a distance of about 8 miles. It then traverses the valley to the mouth of the Kankakee river, a distance of 42 m., passing through the towns of Lockport and Joliet, and receiving water from four feeders, Calumet, Des Plaines, Du Page, and Kankakee rivers. The canal now follows the valley of the

Illinois river to its terminus, La Salle, passing through the towns of Morris and Ottawa, receiving water from Fox river; the whole length being 96 miles. The water at La Salle is 145 ft. lower than lake Michigan, and the descent is accomplished by means of 17 locks, varying in lift from $3\frac{1}{2}$ to 10 feet. The locks are 110 ft. long by 18 wide, giving passage to boats of 150 tons. One effect contemplated and secured by this great work has been the purification of the water in the Chicago river, formerly almost stagnant, with a scarcely perceptible current into lake Michigan, and retaining much of the sewage of the great city; but now flowing freely in the opposite direction toward the Mississippi and the gulf of Mexico.

ILOPANGO, a lake of Central America, in the republic of San Salvador, of volcanic origin, 14 m. long, 6 m. wide. It is situated in a fertile and beautiful plain surrounded by high hills.

IMBERT, BARTHELEMI, 1747-90; b. Nismes, France. His poem, *Le Jugement de Paris*, was for a time very successful, but with the exception of his *Choix d'Anciens Fabliaux*, 2 vols. in verse, none of his works are of much value.

IMMANUEL. See EMMANUEL.

IMMERMANN, KARL LEBRECHT; 1796-1840; b. Germany. Though educated for civil service, and active in political matters in 1815, he devoted himself chiefly to poetry and the drama. His unsuccessful attempt to manage the Düsseldorf theater occasioned a heavy pecuniary personal loss. His tragedies and comedies, though of great merit, were not adapted to the stage. His most valuable work, *Münchhausen*, 4 vols., passed through several editions.

IMMIGRATION (EMIGRATION, *ante*) to the United States far exceeds that to any other country in the world. The steadily increasing current of human beings flowing hither from the ends of the earth attracts universal attention and demands serious deliberation. There are traditions of the simultaneous migration of entire nations in the early ages, but never since the dispersion at Babel has there been anything of such general and cosmopolitan nature as that which forms one of the great phenomena of the age—American immigration. Before the revolution there were few immigrants. The earliest were the gold-seekers from Spain, but they had no intention of remaining in the country. The moving causes of immigration to Canada and New England were religious and political troubles. The Puritans came for religious freedom. The revocation of the edict of Nantes drove a great number of Huguenots across the sea. Yet before the Revolution the extent of immigration was not significant. The establishment of a free republic brought a change, and Europe began to send forth her thousands; but they were as nothing when compared with the myriads of modern times. Up to 1820 no official records of immigration were kept. It was reckoned that from 1784 to 1794 the arrivals were not more than 4,000 per year. In 1794, owing to war between England and France, the arrivals reached about 10,000; but this was an exceptional year, and the number of arrivals was not again so large until 1807. Dr. Seybert, in his *Statistical Annals of the United States*, says the average of immigration from 1790 to 1810 was about 6,000 a year. During the decade 1806-16 immigration was almost suspended in consequence of war with England and serious political complications with France. England's doctrine—relinquished only after a war—"Once a subject, always a subject," was sufficient to deter most people from attempting to leave that country while the war was going on. The blockading of the French ports under the British orders in Council, Jan., 1807, and Napoleon's prompt retaliation in the Berlin decree of the same year, which interdicted commerce with Great Britain, followed by the Milan decree against all continental intercourse with the British, were other powerful influences to check and indeed practically destroy European emigration. The French decrees were annulled in 1811, just before the war between the United States and Great Britain, and American ships were released by France only to fall into the clutches of British cruisers. During the three years of war immigration was suspended, the arrivals being so few as to be hardly worth noticing. It was not until 1817 that the current of immigration, checked ten years before, began to flow freely, and in that year the arrivals, including American citizens coming home, were 22,240, nearly three times as many as in the preceding year. Great suffering occurred in ships crowded with immigrants, and the attention of congress was drawn to the subject. In the spring of 1818 a bill was proposed to remedy the evils; it was passed in Dec., and approved Mar. 2, 1819. In compliance with this act collectors of customs have ever since reported to the treasury department the number of passengers from other countries arriving in their several districts, with the sex, ages, and occupations of such passengers, and the countries in which they were born.

The following table gives the aggregates of immigration at all ports, from the organization of the government to Jan., 1880:

NUMBER OF ALIEN PASSENGERS ARRIVED IN THE UNITED STATES FROM FOREIGN COUNTRIES, FROM OCT. 1, 1819, TO JUNE 10, 1880.

PERIOD.	Alien Passengers Arrived.	Immi- grants ar- rived.	Excess of Immigr'nts over emi- grants.	PERIOD	Alien Passengers Arrived.	Immi- grants ar- rived.	Excess of Immigr'nts over emi- grants.
1820.....	8,385	.....	.....	1850 (to Dec. 31).	59,976	.....	.....
1821.....	9,127	.....	.....	1851 (to Dec. 31).	379,466	.....	.....
1822.....	6,911	.....	.....	1852.....	371,608	.....	.....
1823.....	6,354	.....	.....	1853.....	368,643	.....	.....
1824.....	7,912	.....	.....	1854.....	427,833	.....	.....
1825.....	10,199	.....	.....	1855.....	300,877	.....	.....
1826.....	10,837	.....	.....	1856.....	300,096	195,837	.....
1827.....	18,875	.....	.....	1857.....	250,882	246,945	.....
1828.....	27,382	.....	.....	1858.....	122,872	119,501	.....
1829.....	22,530	.....	.....	1859.....	121,075	118,616	.....
1830 (to Sept. 30)	23,322	.....	.....	1860.....	153,418	150,237	.....
1831.....	22,633	.....	.....	1861.....	91,822	89,724	.....
1832.....	53,179	.....	.....	1862.....	91,826	89,007	.....
1832 (to Dec. 31).	7,303	.....	.....	1863.....	176,214	174,524	.....
1833 (to Dec. 31).	58,640	.....	.....	1864.....	193,416	193,195	.....
1834 (to Dec. 31).	65,365	.....	.....	1865.....	248,111	247,453	.....
1835.....	45,374	.....	.....	1866 (to June 30)	167,757	166,112	.....
1836.....	76,242	.....	.....	1867 (to June 30)	303,044	298,967	273,463
1837.....	79,340	.....	.....	1868.....	288,088	282,189	260,813
1838.....	38,914	.....	.....	1869.....	363,974	352,768	316,029
1839.....	68,069	.....	.....	1870.....	402,920	387,203	354,899
1840.....	84,066	.....	.....	1871.....	342,609	321,350	298,724
1841.....	80,289	.....	.....	1872.....	422,978	404,806	379,130
1842.....	104,565	.....	.....	1873.....	473,141	459,803	401,731
1843 (to Sept. 30)	52,496	.....	.....	1874.....	327,949	313,359	240,993
1844 (to Sept. 30)	78,615	.....	.....	1875.....	244,632	227,498	184,744
1845.....	114,371	.....	.....	1876.....	189,991	169,986	106,373
1846.....	154,416	.....	.....	1877.....	165,019	141,867	69,954
1847.....	234,968	.....	.....	1878.....	157,776	138,469	73,914
1848.....	276,527	.....	.....	1879.....	197,954	177,826	135,825
1849.....	297,024	.....	.....	1880.....	484,196	457,257	.....
1850.....	310,004	.....	.....		

Statistics of the sex and ages of immigrants are not complete, but, as the proportions do not vary in any perceptible degree from time to time, the figures of a single year will represent the average. They are:

Male adults.....	146,223—	49.63 per cent of all immigration.
Female adults.....	86,089—	29.23 per cent.
Children under twelve years.....	60,532—	20.55 per cent.
Unascertained.....	1,637—	.59 per cent.
Total.....	294,581—	100.00 per cent.

The following table denotes the sexes and ages of immigrants from 1820 to 1860, inclusive:

AGES.	Males.	Females.	Total.	Per Cent. Male.	Per Cent. Female.
Under 5.....	218,417	200,676	419,093	4.14	3.81
5—10.....	199,704	180,606	380,310	3.79	3.42
10—15.....	194,580	166,833	361,413	3.69	3.16
15—20.....	404,338	349,755	754,093	7.67	6.63
20 and under.....	1,017,039	897,890	1,914,909	19.29	17.02
20—25.....	669,853	428,974	1,098,827	12.71	8.13
25—30.....	576,822	269,554	846,376	10.94	5.11
30—35.....	352,619	163,778	516,397	6.69	3.12
35—40.....	239,468	114,165	353,633	4.54	2.16
40 and over.....	342,022	200,322	542,344	6.40	3.80
20 and over.....	2,180,774	1,176,793	3,357,577	41.37	22.32
Total.....	3,197,823	2,074,663	5,272,486	60.66	39.34

It is worthy of note that of all immigrants 64 in every 100 are in the reproductive age. This accounts for the often-noticed fact that foreigners are, or appear to be, more prolific than natives. An examination of the census shows that nearly 45 per cent of male immigrants are between the ages of 20 and 40; while of male natives, 14½ per cent are within that period. There is, in fact, but slight difference in the proportion of children to mothers between natives and foreigners. In the New York census of 1865 it was shown that the average number of children to native mothers was 341 in 100, while for foreign mothers it was 360 per 100.

The nationality of immigrants has, of late years, been very carefully recorded, especially at New York, where nearly 77 per cent of the strangers are landed. The following table will show where the greater portion of the vast multitude came from:

Ireland.....	3,065,761
England.....	894,444
Scotland.....	159,547
Wales.....	17,893
Other British.....	560,237
Total from British islands.....	4,697,912
Germany.....	3,081,812
Sweden.....	177,664
Norway.....	128,428
Denmark.....	48,620
Holland.....	44,319
Belgium.....	23,267
Mainly Teutonic.....	3,504,110
France.....	313,700
Switzerland.....	83,709
Italy.....	69,559
Spain.....	28,091
Portugal.....	9,062
Latin races.....	504,121
Russia.....	38,038
Poland.....	14,231
Hungary.....	6,085
	58,344

Hungarians are often counted as Austrians. Some thousands and hundreds from other European nations make up the greater part of the remainder.

The Chinese arrivals up to 1877 numbered 207,270; but probably not more than 100,000 have ever been in the country at one time. The whole number of countries and islands from which immigrants have been received is nearly seventy. A general summary for nine years is here given:

From Europe.....	234,548	351,265	396,380	261,292	181,635	130,103	105,092	100,832	133,070	1,914,157
From Asia.....	7,336	7,825	20,326	13,857	16,493	22,943	10,610	9,014	9,660	117,999
From Africa.....	43	62	39	22	54	54	22	11	17	327
From America.....	48,810	42,305	40,337	35,329	26,612	24,686	24,065	27,204	33,025	302,343
From Pacific Isl's.....	25	2,416	1,413	1,170	1,269	1,312	914	606	816	9,941
From all others, not specified.....	658	1,033	1,308	1,719	1,400	888	1,124	799	1,238	10,167
Aggregate.....	321,350	404,806	459,803	313,339	227,498	162,986	141,857	138,469	177,826	2,354,934

As New York is the main port of debarkation for immigrants, that state in 1847 established a board of commissioners of immigration, through whose care nearly 8,000,000 immigrants have passed. A strong effort has been made in congress to take the control of immigration into the care of the general government, but thus far without success.

The destination of immigrants has been inquired for by the New York commissioners since 1854, with the following results:

Eastern States.	Number.
Maine.....	6,437
New Hampshire.....	4,326
Vermont.....	6,454
Massachusetts.....	179,233
Rhode Island.....	36,224
Connecticut.....	71,132
Total Eastern States.....	303,806

Nearly all who go east are employed in manufactories.

Middle States.	Number.
New York.....	1,572,542
New Jersey.....	123,361
Pennsylvania.....	402,491
Maryland.....	28,286
Delaware.....	3,514

Total Middle States..... 2,130,194
AM. AD. II.—38

The great number under "New York" includes many of those who have not determined upon a place for final settlement.

Middle Western States.	Number.
Ohio	201,016
Michigan	109,290
Indiana	48,822
Illinois	365,926
Wisconsin	191,656

Total Middle Western..... 916,710

West of the Mississippi.	Number.
Minnesota	73,369
Iowa	85,369
Missouri	71,297
Kansas	23,572
Nebraska	22,459
Colorado	3,250

Total..... 279,316

Pacific States and Territories.	Number.
California	54,987
Oregon	945
Nevada	2,308
Territories	48,201

Total..... 106,441

Of the total for territories, Utah took 40,317—all Mormons.

Southern States.	Number.
Virginia	10,691
District of Columbia	11,597
West Virginia	1,806
North Carolina	1,058
South Carolina	2,806
Georgia	3,212
Florida	814
Alabama	1,016
Louisiana	6,888
Texas	5,415
Arkansas	922
Mississippi	1,362
Tennessee	6,746
Kentucky	17,112

Total..... 71,445

This makes a total of 3,807,715. The remainder went: 74,353 to the British provinces, 2,258 to Mexico, South America and elsewhere, and 22,759 gave no destination; the grand total of whom inquiries were made was 3,906,985. Of those settling in the United States, 5.35 per cent went to New England; 55.59 per cent to the Middle states; 24.07 per cent to the middle Western states; 7.33 per cent to west Mississippi states; 2.79 per cent to Pacific states and territories; and 4.87 per cent to the Southern states. The latter section of the union does not appear to be any more attractive to immigrants than it was in the days of slavery.

Many calculations have been made as to the amount of money brought into the country by immigrants, and the lowest places it at \$50 per head. This would make near \$500,000,000 for the whole. But there is far more value in the labor and enterprise which they bring.

The main causes of advance or decline in immigration are usually war, famine, or financial depression. The *coup d'état* of Dec., 1851, within the three following years sent half a million persons to the United States. The Franco-German war had a similar effect, to a large extent. The Irish famines drove a million of the people of that island to this country. On the other hand, a financial crisis or a war in the United States at once checks immigration, as was seen after the panics or hard times of 1837, '57, '73, and '77. The rebellion naturally kept foreigners away, and the arrivals dropped from 153,640 in 1860 to 91,823 in 1861. The return of prosperity in 1879 started the tide again; and the year 1880 shows a total of nearly half a million of immigrants.

IMMORTALITY, *ante*. I. *Arguments for the fact*. 1. As matter does not cease to exist when it changes its form, so man's spiritual substance at least will not be annihi-

lated when it changes its state: this argument, though not proving personal immortality, prepares the way for its proof. 2. The spirit, as in its nature, distinct from matter, will—we must suppose in lack of proof to the contrary—continue its existence; there is no proof that man's spirit dies; all that is known to die is his body; we must therefore believe his spiritual life to continue. 3. The mental powers, being capable of a development which cannot be reached in this life, must find in the future that unlimited sphere of exertion for which they have wisely been adapted. 4. The wisdom of God will complete what it has begun; his goodness will satisfy the longings of man's spiritual nature; his justice will bring to an end the present disorders of the moral world. 5. Our moral nature prompts the expectation that virtue and right will be rewarded, and vice and wrong punished or repressed in another world, as they are not fully in this. 6. In the history of mankind there has been a general belief in future rewards and punishments. In the Veda of the Hindus, Müller says: "The immortality of the soul, as well as personal responsibility after death, is clearly proclaimed." This statement Prof. Roth confirms, saying: "We find in the Veda, not without astonishment, beautiful conceptions on immortality expressed in unadorned language with child-like conviction." The Chinese show their belief in immortality by worshipping their ancestors. When a man dies, they say he has returned to his family. Confucius taught that the spirits of the good are allowed to revisit their earthly habitations to receive homage and to bestow blessing. The Egyptians believed in a dwelling-place of the dead and a future judgment. "Osiris judges the dead, and having weighed their heart in the scales of justice, sends the wicked into darkness and the just to the god of light." According to Persian belief, man passed to a future of reward or penalty. Some tribes of South American Indians believe that there are two great powers of good and evil and a number of inferior deities who have been the creators of different families; and that when an Indian dies his soul goes to live with the deity who controls his particular family. Another American tribe "expect, when they die, to return to the original seat of their forefathers; the good reaching it by means of the intervening lake, which the wicked, burdened with their sins, cannot cross." The Choctaws are said to "hold that the spirit lives after death and must travel a great distance towards the west, and across a dreadful, deep, and rapid stream upon a long and slippery log. The good pass it safely, but the wicked slip and fall." The native tribes of Australia believe that all good men, who are properly buried, at their death enter heaven, which, they say, is "a delightful place, the abode of two good divinities with an abundance of food, a pleasant climate, freedom from evil spirits, and pleasures suited to their tastes. They believe also in an evil spirit, who dwells in the nethermost regions." "The Greenlander believes that at death the soul travels to a land of perpetual summer, all sunshine and no night. But the journey is difficult and attended with many perils, in some of which the soul, suffering another death may perish utterly, to exist no more." Several nations in Java and America have, it is said, the idea of a perilous bridge which has to be crossed at death; while in Polynesia some think the soul, instead of crossing a bridge, must pass over a great gulf in a canoe. Among the more cultivated ancient nations nobler ideas of immortality were sometimes cherished. Homer represents Achilles as convinced of the existence of souls after death by the appearance to him of the dead Patroclus in a dream. Plato describes Socrates as arguing and declaring the sure immortality of the spirits of good men, and, it would seem, of all men—though only the pure could be happy. The Old Testament Scriptures undeniably refer to the fact of a future life, though they give only an incomplete revelation concerning it. Of Enoch they say, "He was not, for God took him." Abraham, they say, "died and was gathered to his fathers," referring, not to his burial, for he was not buried near their graves, but to his entrance into the future state. So Jacob was gathered to his people when he died, though his burial was delayed many days. So Aaron was gathered to his people, though he was buried on Mount Hor; and Moses also, though no man knew of his sepulcher. Abraham, with other Old Testament believers, desired a heavenly country and "looked for the city which hath the foundations." David said, "I shall be satisfied when I awake with thy likeness." 7. Christ and the New Testament bring life and immortality to light, certifying what had been doubtful and dim. Christ stands as the supreme and final witness to the fact.

II. Its nature and extent. Of its nature we know little, since reason has not the materials for a science of immortality, and revelation is silent except as concerns the moral and practical bearings of the great fact which it affirms with intense energy. What is known through reason or revelation on this theme may be summed up as follows: 1. There is a life for man after the death of the flesh, which life is spiritual, in a spiritual body, amid spiritual surroundings. 2. This life is in the completed likeness of the life of Christ, who is the Son of God and the Head of humanity; therefore a life of blessing, beauty, and glory, of wisdom, power, and holy love—imperishable, incorruptible, eternal: to it pertain consciousness, identity, and a complete moral and spiritual personality. 3. This immortality is naturally possible to every individual person of the human race; being provided and secured in the very creation of the human race in and through the Son of God as the archetype of humanity, so that through him all men are constituted by their nature sons of God. 4. This immortality, naturally possible, becomes actual in the case of every human person who does not

through willful love of evil refuse the eternal life of purity, holiness, and love : thence it becomes actual through Christ in the case of any heathen who sincerely and faithfully seek after God and goodness in the use of such light as they have : thence also it may be considered as applying to infants devoid of willful and personal wickedness. 5. This life, naturally possible to all men, does never become actual in the case of any who willfully refuse the light, and so reject the life. 6. These are not presented in the Bible as having immortality, or as entering into the eternal life, since immortality means deathlessness, and they are presented as under the power of death; yet to assert that they have no continued or future existence of any kind is to assert what no man knows/ or can prove: on the contrary, their future existence, certainly for a time, is indicated; and its everlasting continuance cannot, to say the least, be disproved. Thus, in fine, immortality, or the eternal life of a human spirit joined to the life of God, our thought can take firm hold upon; it is positive, radiant, unquestionable; while as to the eternal death, it is an "outer darkness" with no firm foothold for our thought as to its nature or its scenes. Upon these points, therefore, it is wise to restrict dogmatic assertion. See ESCHATOLOGY.

IMPENNATES, a name which has been applied to a tribe of swimming birds with very short and small wings, upon which there are only rudimentary feathers or scaly skin. The penguin and the great auk are examples. These birds are usually embraced in the family *brevipennate*, which includes penguins, auks, guillemots, divers or loons, and grebes. They belong to the order *natatores*. See PENGUIN, AUK, DIVER, GREBE and GUILLEMOT, *ante*.

IMPERATOR. See EMPEROR, *ante*.

IMPORTS AND EXPORTS (*ante*), or Foreign Trade of the United States. In 1840, when ocean steam navigation began to be successful, the entire importations of merchandise into the United States was valued at only \$86,250,335. The largest value of merchandise in any one year's importation was in 1873, the total being \$642,136,210. The offset of exports for the years named was \$111,660,561 in 1840, and \$505,033,439 in 1873. From 1863 to 1873 the value of imports of merchandise largely exceeded the values of exports, the excess of imports ranging from \$39,371,368 in 1863 to \$182,417,491 in 1872. During the years ending June 30, 1876, '77, '78, and '79, however, the value of exports of domestic merchandise from the United States has greatly exceeded the value of imports, the excess of exports increasing rapidly from year to year. The countries from which imports come are, in the order of value for 1879: Great Britain, \$108,538,812; Cuba, \$63,649,656; France, \$50,684,601; Brazil, \$39,375,441; Germany, \$35,519,818; British America, \$26,133,554; China, \$18,084,694; British East Indies, \$12,225,770; Japan, \$9,845,562; Italy, \$7,884,327; Colombia, \$6,330,946; Spanish possessions, \$5,533,067; Mexico, \$5,493,221; Dutch East Indies, \$5,435,331; Venezuela, \$4,855,034; Porto Rico, \$4,384,954; Belgium, \$4,209,232; British West Indies and Honduras, \$3,719,085; Netherlands, \$3,680,932; Argentine Republic, \$3,518,105; Spain, \$3,334,241; Hawaiian islands, \$3,257,938; Hayti, \$2,790,476; French West Indies and Guiana, \$2,634,090; Central America, \$2,251,589; Peru, \$1,857,859; Uruguay, \$1,780,140; all other countries, \$8,770,303; total imports in 1879, \$445,777,775. The principal articles of importation, and their value in specie, for the years ending June 30, 1878 and 1879, are given in the annexed table:

COMMODITIES IMPORTED.	1878.	1879.
Sugar.....	\$71,924,267	\$70,642,869
Molasses, melada, and cane syrup.....	7,902,181	8,645,197
Coffee.....	51,917,609	47,356,819
Silk, raw.....	5,103,084	8,371,025
" manufactures of.....	19,837,972	24,013,398
Wool, raw.....	8,363,015	5,034,555
" manufactures of.....	25,230,154	24,353,821
Chemicals, drugs, dyes, and medicines.....	24,738,409	27,038,803
Cotton, raw.....	469,882	499,931
" manufactures of.....	19,081,037	19,928,310
Hides and skins, except furs.....	17,223,363	15,959,017
Flax, raw.....	1,177,229	969,451
" manufactures of.....	14,413,600	14,693,842
Tea.....	15,660,168	14,577,618
Tin, and manufactures of.....	12,171,030	12,513,864
Breadstuffs and farinaceous food.....	8,809,499	10,614,173
Fruit and nuts, of all kinds.....	9,738,546	10,316,579
Iron and steel, and manufactures of.....	9,057,632	9,447,148
Leather, and manufactures of.....	7,469,359	7,556,854
Wood, and manufactures of.....	5,736,756	6,257,746
India-rubber and gutta-percha, and manufactures of.....	4,953,666	6,242,225
Wines, spirits, and cordials.....	5,517,427	6,037,093
Tobacco, and manufactures of.....	6,439,868	5,888,876
Jute, grasses, and manufactures of.....	4,104,588	5,557,807
Provisions, including eggs and fish.....	4,776,747	4,575,152
Furs, dressed and undressed.....	3,944,270	4,516,290
Fancy goods.....	4,200,737	4,119,217

COMMODITIES IMPORTED.	1878.	1879.
Earthen, stone, and China ware.....	\$4,051,786	\$4,082,787
Precious stones.....	3,039,102	3,842,007
Glass and glass-ware.....	3,345,149	3,222,150
Buttons and button materials.....	3,362,085	3,197,070
Paper rags and material.....	3,993,669	3,196,243
Animals, living.....	2,664,673	2,794,129
Straw and palm leaf, manufactures of.....	2,296,266	2,548,679
Seeds.....	2,522,202	2,213,847
Books, engravings, and other publications.....	1,870,580	2,057,125
Hemp, raw and manufactured.....	2,443,958	1,936,669
Spices.....	1,936,217	1,824,171
Salt.....	1,632,825	1,776,741
Coal, bituminous.....	1,936,187	1,724,466
Metals, and manufactures of, not specified.....	2,068,570	1,582,884
Dyewoods in sticks.....	1,396,485	1,406,179
Paintings, photographs, and statuary.....	968,517	1,269,039
Paper, and manufactures of.....	1,466,625	1,186,382
Clothing, except of silk or hosiery.....	1,275,419	1,171,296
Hair of all kinds, and manufactures of.....	727,365	912,931
Watches and watch materials.....	812,582	920,599
Paints of all kinds.....	848,113	759,589
Marble and stone, manufactures of.....	746,956	689,288
Beer, ale, and porter.....	592,707	688,806
Musical instruments.....	561,867	627,722
All other merchandise.....	18,565,173	22,376,149
Total imports of merchandise.....	\$437,051,532	\$445,777,775
Total imports of coin and bullion.....	29,821,314	20,296,000

For the fiscal year ending June 30, 1880, the total imports of merchandise were \$667,954,746. Total imports of coin and bullion, \$93,024,310.

In the following table is given the value of the principal commodities of foreign production in which there has been a considerable decrease of importation since 1873, the year of the highest total importation:

COMMODITIES.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Clothing, including hosiery, etc. of cotton and wool.....	\$ 8,496,993	\$ 7,069,996	\$ 7,370,626	\$ 7,004,162	\$ 5,574,412	\$ 6,540,587	\$ 6,560,456
Cotton, manufactures of, with- out hosiery, etc.....	29,752,116	23,572,610	22,790,377	18,042,727	15,119,094	14,398,791	14,930,975
Flax, manufactures of.....	20,428,391	17,472,755	16,603,242	14,456,016	13,915,952	14,413,600	14,693,842
Silk, manufactures of.....	29,890,035	23,996,782	24,380,923	23,745,967	21,830,159	19,837,972	24,012,398
unmanufactured.....	20,433,988	8,250,306	11,071,259	8,247,617	7,156,944	8,393,015	5,931,555
Woolen carpets.....	4,388,257	3,649,863	2,643,932	1,521,092	674,011	398,289	267,106
dress goods.....	19,447,797	21,162,635	19,759,488	14,216,221	12,549,867	12,055,806	12,436,861
Other woollen, not underwear.....	26,629,124	21,565,581	21,522,523	16,800,902	11,918,103	12,199,037	11,158,080
Copper, and manufactures of.....	3,687,006	451,636	348,071	515,228	584,712	371,518	294,707
Lead, and manufactures of.....	3,217,163	2,164,788	1,449,976	598,266	748,682	361,894	64,340
Tea.....	24,466,170	21,112,234	22,673,703	19,524,166	16,181,467	15,660,168	14,577,618
Iron and steel, and manufac- tures of.....	59,308,452	33,793,456	18,475,723	13,191,618	9,570,606	9,057,632	9,447,148
India-rubber and gutta-percha.....	900,187	803,820	513,979	428,575	325,113	242,564	174,137
Leather of all kinds.....	6,766,202	6,138,528	5,941,228	3,966,881	4,589,713	3,784,729	3,067,564
Watches and watch movements.....	3,274,825	2,374,394	2,285,925	1,456,809	772,432	812,582	920,599

Exports of merchandise from the United States have increased rapidly in value in recent years. In 1845 the exports were a little less than \$100,000,000 in value; in 1897 the value was \$710,439,441. In 1845 the imports nearly equaled the exports; in 1879 the imports were only about 63 per cent of the exports. During 1879 the exports of domestic produce of the United States to Great Britain and Ireland amounted in value to \$346,485,881, being 50 per cent of the total export of domestic merchandise for the year. There was a falling off in value of \$37,121,030 from the preceding year, though the quantities of the several articles were about the same, the difference being caused by a decline in prices for cotton, wheat, corn, and some other articles. In the same period the value of exports to France rose from \$54,289,918 to \$88,194,041, the increase being chiefly in wheat. The principal countries to which the agricultural and other products of the United States are sent stood, in the order of value of exports in 1879, as follows: Great Britain and Ireland, \$346,485,881; France, \$88,194,041; Germany, \$56,164,394; British America, \$28,281,569; Belgium, \$27,470,003; Russia, \$15,959,701; Netherlands, \$13,802,840; Spain, \$12,438,903; Cuba, \$12,201,691; Italy, \$8,657,403; Brazil, \$8,106,928; Australia, \$7,042,875; British West Indies and Honduras, \$6,779,153; China, \$5,930,594; Mexico, \$5,400,380; Colombia, \$5,199,648; Portugal, \$4,897,290; Turkey, \$3,989,230; Hayti, \$3,148,757; Japan, \$2,674,601; Austria, \$2,640,648; Hawaiian

islands, \$2,288,178; Denmark, \$2,284,784; British Africa, \$2,168,076; Sweden and Norway, \$2,138,461; Argentine republic, \$2,033,401; Venezuela, \$1,926,923; Porto Rico, \$1,771,483; British Guiana, \$1,719,827; French West Indies and Guiana, \$1,535,768; Dutch East Indies, \$1,447,510; Gibraltar, \$1,297,820; Peru, \$1,293,991; Chili, \$1,253,555; British East Indies, \$1,142,196; Central America, \$1,110,603; all other countries, \$8,538,276; total exports of merchandise from the United States in 1879, \$699,538,742.

In the following table is a comparison of the quantities of leading articles of export for three years, with the increase in 1879 over 1876:

COMMODITIES.	Year ending June 30—			Exports of 1879 over 1876.	Per cent Increase.
	1873.	1876.	1879.		
Indian corn, bushels.....	38,541,920	49,493,572	86,296,252	36,802,680	74.4
Wheat.....	39,204,285	55,073,122	122,353,936	67,280,814	122.2
Wheat flour, bbls.....	2,562,086	3,935,512	5,629,714	1,694,202	43.0
Cotton, manufactured, yards.....	13,772,774	75,807,481	129,197,377	53,389,896	70.4
Locomotives, No.....	58	44	73	29	65.9
Mineral oil for light, gallons.....	158,102,414	204,814,673	331,586,442	126,771,769	61.9
Bacon and hams, lbs.....	395,381,737	327,739,172	732,249,576	404,519,404	123.4
Beef, fresh and salt, lbs.....	31,605,196	36,596,150	90,976,395	54,380,245	148.6
Butter,.....	4,518,844	4,611,891	38,248,016	33,608,122	723.4
Cheese,.....	80,366,540	97,676,264	141,654,474	43,978,210	45.0
Lard,.....	230,534,207	168,405,839	326,658,686	158,252,847	94.0
Sugar, refined,.....	9,870,738	51,840,977	72,309,009	20,468,032	39.5
Tobacco, leaf,.....	213,995,176	218,310,265	322,279,540	103,969,275	47.6

The tables which follow need no special explanation:

VALUE OF THE EXPORTS OF BREADSTUFFS, RAW COTTON, PROVISIONS, MINERAL OIL, AND TOBACCO AND ITS MANUFACTURES, DURING THE FISCAL YEARS NAMED.

Year.	Breadstuffs.	Cotton raw.	Provisions.	Mineral Oil.	Tobacco.
	\$	\$	\$	\$	\$
1821.....	5,184,999	20,157,484	63,246,817	None.	5,798,045
1830.....	7,071,767	29,674,883	62,971,002	"	5,823,112
1840.....	13,535,926	63,870,307	63,503,704	"	10,697,628
1850.....	13,066,549	71,984,616	610,927,435	"	10,599,855
1860.....	24,422,310	191,806,555	16,612,443	"	19,289,975
1861.....	72,152,366	34,051,483	20,807,898	"	16,545,241
1862.....	84,183,754	1,180,113	34,686,292	61,529,027	13,402,000
1863.....	89,180,332	6,652,405	53,771,543	627,839	23,150,253
1864.....	63,436,254	9,895,854	47,504,323	10,782,689	26,493,819
1865.....	53,964,589	6,836,400	52,060,953	16,563,413	45,307,933
1866.....	41,249,054	281,385,223	29,503,996	21,830,887	31,428,561
1867.....	41,288,804	201,470,423	26,463,972	24,407,642	22,571,912
1868.....	69,021,059	152,820,733	30,436,642	21,810,676	26,077,987
1869.....	53,724,151	162,633,052	29,655,056	31,127,433	23,347,719
1870.....	72,250,923	227,027,624	29,175,539	32,608,960	22,705,225
1871.....	79,381,187	218,327,109	38,845,219	36,894,810	21,995,957
1872.....	81,586,273	180,684,595	59,696,670	34,058,390	26,659,921
1873.....	93,743,151	227,243,069	78,137,241	42,050,756	25,391,946
1874.....	161,198,864	211,223,580	78,328,990	41,245,815	32,968,528
1875.....	111,458,265	190,638,625	81,343,401	30,078,568	27,844,470
1876.....	131,181,555	192,659,262	89,881,747	32,915,786	25,570,538
1877.....	117,806,476	171,118,508	114,991,749	61,789,438	32,020,214
1878.....	181,777,841	180,031,484	123,556,325	43,574,974	28,484,482
1879.....	210,355,528	162,304,250	116,858,650	40,305,249	23,215,240

a includes tallow, hides, horned cattle, and hogs. These articles are not included in amounts for subsequent years. b. Records for 1862-3 very imperfect.

EXPORTS OF AGRICULTURAL PRODUCTS AT VARIOUS PERIODS.

Year.	Domestic Merchandise.	Products of Agriculture.	Per cent Agricultural.	Year.	Domestic Merchandise.	Products of Agriculture.	Per cent Agricultural.
	\$	\$			\$	\$	
1830.....	58,524,878	48,095,184	82.18	1873.....	575,227,017	446,968,172	77.70
1840.....	111,660,561	92,548,067	82.93	1874.....	623,339,368	501,372,947	79.17
1850.....	134,900,233	108,605,713	80.51	1875.....	559,237,638	490,575,923	77.00
1860.....	316,242,423	256,560,972	81.14	1876.....	594,917,715	456,420,995	76.72
1870.....	455,208,341	361,188,483	79.34	1877.....	632,980,854	459,439,933	72.59
1871.....	478,115,292	368,278,292	77.03	1878.....	695,749,930	536,038,954	77.05
1872.....	476,421,178	368,852,852	77.42	1879.....	669,598,742	543,691,174	77.72

MERCHANDISE.

VALUE OF MERCHANDISE IMPORTED INTO AND EXPORTED FROM THE UNITED STATES FROM 1860 TO 1879, INCLUSIVE; ALSO ANNUAL EXCESS OF IMPORTS OR OF EXPORTS (SPECIE VALUES).

Year ending June 30—	EXPORTS.		Total Exports.	Imports.	Excess Exports over Imports.	Excess Imports over Exports.
	Domestic.	Foreign.				
	\$	\$	\$	\$	\$	\$
1860.....	316,242,423	17,333,634	333,576,057	253,616,119	.....	20,940,062
1861.....	204,899,616	14,654,217	219,553,833	289,310,542	.....	69,756,709
1862.....	179,644,024	11,036,477	190,680,501	189,356,677	1,313,824	.....
1863.....	186,003,912	17,960,535	203,964,477	243,345,815	.....	39,371,308
1864.....	143,504,027	15,333,961	158,837,988	316,447,283	.....	157,609,295
1865.....	136,940,248	29,089,055	166,029,303	238,745,580	.....	72,716,277
1866.....	337,518,102	11,341,420	348,859,522	434,812,066	.....	82,953,544
1867.....	279,786,809	14,719,232	294,506,141	395,761,996	.....	101,251,955
1868.....	269,389,900	12,562,999	281,952,899	357,436,440	.....	75,483,541
1869.....	275,166,697	10,951,000	286,117,697	417,506,379	.....	131,388,682
1870.....	376,616,473	16,155,295	392,771,768	435,958,408	.....	43,186,640
1871.....	428,398,908	14,321,270	442,820,178	520,223,681	.....	77,403,506
1872.....	428,487,131	15,690,455	444,177,586	626,595,077	.....	182,417,491
1873.....	507,033,439	17,446,483	524,479,922	642,136,210	.....	119,656,288
1874.....	569,433,421	16,849,619	586,283,040	567,406,342	18,876,698	.....
1875.....	499,284,100	14,158,611	513,442,711	533,005,436	.....	19,562,725
1876.....	525,582,347	14,802,424	540,384,671	460,741,190	79,643,481	.....
1877.....	589,670,224	12,894,996	602,425,220	451,323,126	151,152,094	.....
1878.....	680,709,268	14,156,498	694,865,766	437,051,532	257,814,234	.....
1879.....	698,340,790	12,098,651	710,439,441	445,777,775	264,661,666	.....

TOTAL COMMERCE OF THE UNITED STATES.

The following table exhibits the combined value of merchandise and specie imported into and exported from the United States in the years named. It affords an expression of the aggregate foreign commerce of the country:

VALUE OF MERCHANDISE AND OF GOLD AND SILVER COIN AND BULLION IMPORTED INTO AND EXPORTED FROM THE UNITED STATES FROM 1860 TO 1879, INCLUSIVE (SPECIE VALUES).

Year end'g June 30—	EXPORTS.		Total Exports.	Imports.	Total Imports and Exports.	Excess Exports over Imports.	Excess Imports over Exports.
	Domestic.	Foreign.					
	\$	\$	\$	\$	\$	\$	\$
1860.....	373,189,274	26,933,022	400,122,296	392,196,254	792,388,550	37,956,042	.....
1861.....	228,699,486	20,645,427	249,344,913	315,650,153	564,995,066	.....	86,305,240
1862.....	216,688,675	16,869,466	233,558,141	265,771,729	499,329,870	21,786,412	.....
1863.....	241,997,474	26,123,584	268,121,058	252,919,920	521,040,978	15,211,138	.....
1864.....	243,977,529	20,256,940	264,234,469	329,562,895	593,797,424	.....	65,328,396
1865.....	201,558,372	32,114,157	233,672,529	218,555,652	452,228,181	.....	14,883,123
1866.....	420,161,476	14,742,117	434,903,593	445,542,158	880,415,751	.....	10,608,565
1867.....	334,763,005	20,611,508	355,374,513	411,831,571	773,206,084	.....	62,457,059
1868.....	353,135,875	22,601,126	375,737,001	371,624,808	747,361,809	4,112,193	.....
1869.....	318,082,663	25,173,414	343,256,077	437,514,355	780,570,332	.....	94,058,178
1870.....	420,500,275	30,427,159	450,927,434	462,377,587	913,305,021	.....	11,150,153
1871.....	512,802,267	28,459,899	541,262,166	541,493,708	1,082,755,874	.....	231,542
1872.....	501,285,371	22,769,749	524,055,120	640,338,766	1,164,393,886	.....	116,283,646
1873.....	578,998,985	28,149,511	607,088,496	693,617,147	1,270,705,643	.....	56,528,651
1874.....	629,133,107	23,780,328	652,913,435	595,861,147	1,248,774,633	57,052,197	.....
1875.....	583,141,229	22,433,621	605,574,853	533,906,153	1,139,481,006	51,668,700	.....
1876.....	575,629,938	21,270,095	596,899,973	476,677,871	1,073,568,844	120,213,102	.....
1877.....	634,763,062	25,822,135	660,585,197	492,067,540	1,152,652,737	166,239,917	.....
1878.....	707,771,153	20,831,738	728,602,891	466,872,846	1,195,475,737	261,730,045	.....
1879.....	715,805,825	19,541,067	735,346,892	466,073,775	1,201,510,657	269,363,107	.....

This immense commerce is done mainly by foreign vessels. In 1856 the percentage carried in American vessels was 72.2; in 1879 it was only 23. There has been a gradual but regular decrease of ocean trade in American vessels since 1868.

IMPOSTORS. THE THREE, the name of a work supposed to have been written against the Jewish, Christian, and Mohammedan religions, and often mentioned since the 10th century. Its title is *De tribus Impostoribus*. Its genuineness is doubtful.

IMPRISONMENT (*ante*) is the restraint of a person's liberty for any cause whatever, whether by authority of the government or in defiance thereof. In the latter case it is "false imprisonment." It does not necessarily imply a prison with bolts and bars, but may be exercised by an array of force, lawfully or unlawfully, in the open street. A man becomes a prisoner wherever he may be, by the mere word or touch of a duly authorized officer directed to that end. Usually, however, imprisonment is understood

to imply an actual confinement in some jail or prison employed for the purpose according to the provisions of law. The power to imprison is, in many cases, inherent in courts or magistrates, and in others conferred upon them by statute, and it may be employed in civil as well as criminal proceedings. Imprisonment for debt, once universal in this country, under the operation of the English common law, is now generally abolished by statute, except in cases where the action of the debtor is tainted by fraud, or he is reasonably suspected of an intention to avoid his debt by concealing his property, or removing that and himself from the state. Witnesses whose testimony is necessary for the conviction of a criminal, often are imprisoned to prevent their escape from the jurisdiction of the court. Persons accused of crime are either confined till the day of trial, or released on bail, according to the gravity of the offense. Courts have the power to imprison for contempt of their authority, and persons found guilty of crime are imprisoned for periods definitely fixed by statute or by the judgment of the court. The confinement of lunatics in asylums appointed for the purpose is not here considered, as such asylums are not usually regarded as prisons. A person who wrongfully or illegally deprives another of liberty may be sued in a civil action for false imprisonment by the person aggrieved, or prosecuted as for a criminal offense. A prisoner desiring release is entitled to a writ of *habeas corpus* to obtain the judgment of a competent court as to the legality or illegality of his imprisonment.

INACHIUS, a name in Grecian mythology given to a river in Argos, and also to the god of the river. When Neptune and Juno disputed about the possession of Argos, and Inachus decided for Juno, Neptune is said to have dried up the river. Inachus is described also as the first king of Argos and leader of the Argives from the mountains to the plains, from whom Argos is called Inachian.

INCARNATION, THE (*ante*). The coming of the Son of God in human flesh is the great fact which gives unity to the Scriptures and reveals God to men. Before it was accomplished it was prefigured in a series of preliminary manifestations of the Deity in human form, to whom the Scriptures ascribe the names Angel Jehovah, Jehovah, and God. See JEHOVAH. The incarnation of God in Jesus Christ, fully denied by some, indeterminately held by many more, but by the great majority of thinkers in Christendom accepted in various forms of philosophic statement, may be briefly outlined from the Scriptures on whose testimony it rests. A permanent and perfect union of the Divine being and the human nature has been constituted in human history in the person of Jesus the Christ, and this not as creating a unity previously non-existent, but as restoring and historically developing a perfectly *natural* union. 1. That this would be done was foretold by prophecy. (1) It promised that the Messiah of God would be a man. The first announcement of a deliverer was made after the fall of man, in the Lord's declaration to Satan under the guise of the serpent: "I will put enmity between thy seed and the seed of the woman; he shall bruise thy head and thou shalt bruise his heel." The promise to Abraham was that in him and his seed (whence, according to the flesh, Christ came) all the families of the earth should be blessed. Jacob's prophecy implied that the Shiloh, the giver of peace, would be a descendant of Judah. The Lord's covenant with David was that, in the distant future, his exalted son should sit on his throne. David describes the mortal suffering of a man whose soul should not be given up to the dead, nor his body to the corruption of the grave. Isaiah foretold that a child would be born who should exercise government on the throne of David; that a man would be as a covert from the tempest; and that the anointed servant of the Lord would be a man of sorrows, rejected of men, bearing the sins of many, and that he would die and be buried. Jeremiah prophesied that there would be raised up to David a righteous branch and prosperous king. Daniel was instructed by the angel that, at the time appointed, the Messiah would be cut off, but not for himself. Zechariah proclaimed the man whose name is "the Branch;" who would be a king and priest on his throne; would be lowly, riding on the foal of an ass; and be smitten as the shepherd of the flock. Micah announced that the promised ruler of Israel would be born at Bethlehem. (2) Prophecy declared that the Messiah would be a divinely human personality. David called him who in the future would sit on his throne, his lord; saying, Jehovah said to my lord, sit thou on my right hand. Therefore, since in his human nature he was to be David's son, he must possess also the divine personality in order to be David's lord. Isaiah foretold that the name of the child to be born and to rule over the kingdom of David would be Wonderful, Counselor, the mighty God, the father of eternity—that is, according to the Hebrew idiom, the Eternal. Jeremiah prophesied that the name of the future righteous son of David would be Jehovah our righteousness. Zechariah said that the man who would be smitten as the shepherd is the "fellow" of Jehovah; and that he whose feet would stand on the Mount of Olives is Jehovah. Micah declared that the going forth to rule of him who would be born in Bethlehem was only one of those goings forth which have been from of old, even from everlasting. Malachi gives the closing assurance that the angel of the covenant, the Messiah, who would suddenly come to his temple, is the Lord. 2. The New Testament declares that the union of the divine being and the human nature has been historically constituted in the person of Jesus Christ. (1) It speaks of him as a man of the house and lineage of David; narrating his birth, childhood, youth, manhood, words, works, sufferings, and death; re-

recording more than 60 times his own application to himself of the title, the Son of Man; and saying that he ate, spake, heard, slept, walked, wept, and became weary, ascribing to him the emotions, affections, and sentiments of a true humanity. (2) It ascribes to him a personality properly divine: recording more than 100 times the application to him of the title Son of God in a sense in which it is not given to any other being; appropriating to him hundreds of times the title Lord, which corresponds to Jehovah in the Old Testament; affirming that he was "the Word" which was in the beginning with God, was God, and is the true God; assigning to him the attributes of God; prescribing for him the worship and honor due to God, and attributing to him the works of God. (3) Affirming his pre-existence in the bosom of the Father—and his even then continuing existence therein—together with his historical assumption of the human nature, the New Testament teaches that he unites the true divine being and the true humanity in one person. It declares that the Son to whom it was said, "Thy throne, O God, is forever and ever," was brought into this world; that the Word who was with God and was God became flesh and dwelt among men, some of whom saw his glory, the glory as of the only-begotten of the Father; that he who was in the form of God took on himself the form of a servant, and was made in the likeness of men; that that which was from the beginning, the word of life, the eternal life which was with the Father, manifested in the world, was heard, seen, gazed on, and touched by men; that God was manifested in the flesh; and that he who is a descendant from the whole scriptural line of the fathers, is also over all, God blessed forever.

The view, not widely spread but ably advocated, that Christ was in no strict and proper sense the incarnation of God, does not base itself on the Scriptures, though seeking incidental confirmations in them. On the point under consideration, it stands in either a philosophical or a historical denial, usually in both; and this denial involves at least one of three modes of dealing with the Bible: (1) a refining of its language into a sense far from the ordinary use of words; (2) a doubt of the correctness of the scriptural documents as documents, in view of their liability to accidental changes in their transmission from antiquity; (3) a denial of the original authority of the Scriptures as a declaration of truth—this denial extending beyond the question of their infallibility, beyond that of their divine inspiration, to that of their truthfulness as mere human history or of their truthfulness as the testimony of men who claimed to be eye-witnesses of the facts which they record.

Philosophically, the incarnation of God touches the deepest problems; and historically its principle is traceable through many distortions in the great religions of the world.

INCHBALD, ELIZABETH SIMPSON, 1753-1821; b. England; was the daughter of a farmer, and distinguished herself as an actress, dramatic author, and novelist. After failing in her first attempts on the stage, she married Inchbald, the comedian, who trained her in the dramatic art, and with him she acted in several theaters in England, and in Edinburgh, with applause. After his death she wrote plays, and played at Covent Garden for nine years, and then devoted herself with success to literary pursuits. Her published works are dramas translated from German and French; *The British Theater*, 25 vols.; *The Modern Theater*, 10 vols.; a collection of *Farces*, 7 vols.; and her *Romances* in 4 vols., *A Simple Story*, translated into several European languages, and *Nature and Art*, have been very popular. Her *Memoirs*, a work of much interest, compiled from an autograph journal kept for 50 years, were published in 1833.

INCLEDON, BENJAMIN CHARLES, 1764-1826; b. England. Educated as a musician in the choir of Exeter cathedral, he excelled as a ballad-singer for 25 years. He visited the United States in 1817, but his voice had failed through age, and he was not greatly successful, though his singing in the old cathedral in New York was long remembered.

INCOME TAX (*note*). An income tax has been very unpopular in both England and the United States. Even its advocates are in favor of leaving incomes below a certain amount untaxed altogether. In England incomes under £100 are exempt, and those between £100 and £150 pay a lower percentage. One-sixth of the revenue of Great Britain is said to be derived from this source. In the United States the government imposed an income tax from 1863 to 1872, exempting at first \$600, and levying 5 per cent on all incomes above that to \$5,000, 7 per cent on those from \$5,000 to \$10,000, and 10 per cent on all above \$10,000. The tax afterwards was exempted on \$1000 and later on \$2000. The largest amount received from personal incomes was \$61,000,000 in 1866 from nearly half a million persons assessed. The receipts in 1867 were \$27,418,000; in 1868, \$23,390,000; in 1869, \$27,353,000; in 1870, \$26,153,000. The income tax expired by limitation at the close of 1871.

INDEPENDENCE, a n.e. co. of Arkansas, traversed by the White river; 1019 sq.m.; pop. '80, 18,086. The surface is uneven. The soil is fertile, producing grain, cotton, tobacco, maize, hay, and cattle. It abounds in timber, and has valuable minerals.

INDEPENDENCE, a city in Buchanan co., Iowa, on the Wapsipicon river, and at the junction of the Illinois Central and Burlington, Cedar Rapids, and Minnesota railroads, 65 m. w. of Dubuque; pop. '70, 2,945. It has 2 banks, 9 churches, 10 public schools, 2 newspapers, 3 fire-companies, several fine parks, and extensive fair-grounds.

It is the seat also of the state insane asylum, which in 1873 contained 113 patients, and whose erection cost nearly \$1,000,000.

INDEPENDENCE, a city of Jackson co., Mo., on the Union Pacific railroad, 4 m. s. of Missouri river, 10 m. e. of Kansas City, and connected with it by a railroad; pop. '70, 3,184. It has 2 banks, 2 newspapers, 3 hotels, several public schools, and 2 colleges. It was settled in 1827, and was formerly the rendezvous for the emigrant trains from the e. to California, Oregon, New Mexico, and Utah, and was occupied in 1831 by the Mormons, who were expelled in 1838 and settled in Illinois, and afterwards in Utah.

INDEPENDENCE, a t. of Washington co., Texas, 80 m. e. of Austin, 25 m. from Hempstead, on the Houston and Texas Central railroad, 12 m. from Brenham, on the w. branch of that road; pop. 1000. It has public schools, several churches, is the seat of Baylor university, and Baylor college for women, controlled by the Baptists. The university has a theological department, with 5 professors, 80 students, and a library of 2,700 volumes.

INDEPENDENCE, DECLARATION OF. See DECLARATION OF INDEPENDENCE.

INDEPENDENCE OF STATES, a term applied to states which by international law are self-governing as to their internal affairs, and also perform international acts towards other states. None of the United States being absolutely self-governing, and none having any international character, none is independent.

INDEPENDENTS (*ante*). See CONGREGATIONALISM.

INDIA, PORTUGUESE, is now confined to the territories indicated in the annexed table:

Name.	Locality.	Area in Sq. Miles.	Population.
Goa, etc.	Western coast.	1400	392,234
Damaun.	Concan coast.	42	53,283
Diu.	South coast of Kattywar }		

INDIANA (*ante*), was a part of the territory claimed by the French previous to the cession of Canada to England in 1763. As early as 1702 emigrants from Canada made settlements at Vincennes, Corydon, and other places. They amalgamated with the Indians so far at least as to adopt many of their customs and habits. Soon after the country was transferred to the United States there were troubles with the Indian tribes, which caused great distress among the settlers at Vincennes. These troubles continued for several years, but a temporary peace was conquered by gen. Wayne. In May, 1800, Ohio was erected into a separate territory, while all the region w. and n. was included in the territory of Indiana, organized two months later, with William Henry Harrison as governor. Michigan and Illinois were subsequently organized, reducing Indiana to its present limits. After this the Indians again became troublesome, and the growth of the white settlements was impeded. The census of 1810, however, showed a population of 24,520. The national government, in 1811, determined to subdue the savages, and gov. Harrison was placed in command of a force of regulars and militia for that purpose, Tecumseh, a chief of the Shawnees, was the Indian leader—a man of unbounded influence with his people. Gen. Harrison marched to Tippecanoe on the Wabash, Nov. 6, 1811, and on the following day there was a desperate battle, in which the Indians were defeated, and not long afterwards they sued for peace. When the war with England broke out they rallied again, but were speedily conquered and nevermore troubled the settlers. Dec. 11, 1816, Indiana was admitted to the union, after which the growth of the state in population and wealth was very rapid. Its growth was still further accelerated a few years later by the construction of the national road and the Erie canal, which furnished new outlets for the produce of the west, and greatly diminished the terrors of the journey thither for emigrants from the east. In the ten years ending in 1830, 3,558,221 acres of the public lands were sold in Indiana, mostly to actual settlers. The population in the same time had increased to 343,031. Soon after this the state entered upon several great works of public improvement, by which it incurred a debt of more than \$14,000,000, under which it sank into temporary bankruptcy in the financial revulsion of 1837. Notwithstanding this the population of the state doubled in the decade 1830–40 and 9,122,688 acres of public land were sold. It was not until 1846 that the state succeeded in making provision to meet the annual interest upon its debt. This brought prosperity; and since then its growth has been very rapid.

Indiana has no mountains, and fully two-thirds of its surface is level or undulating. The highest elevation is 540 ft. above the level of the Ohio at the mouth of the Wabash. The hills bordering the rivers inclose wooded bottom lands of the richest quality. Many of the hills on the Ohio are as high as the highest interior elevations. At the points where they are broken by tributary streams the scenery is quite picturesque. The table-lands of the interior are either vast level prairies, interspersed with groves of oak, ash, and other trees; or undulatory, with occasional hills rising from 100 ft. to

300 feet. Near the Ohio river some of the land is hilly or sterile, but mostly it is very productive. The principal river valleys are exceedingly fertile. The largest of these n. of the Ohio is that of the Wabash, containing 12,000 sq. miles. The next in size is that of White river, containing 9,000 sq. miles. The valley of the Maumee, in the n.e. part of the state, embraces an area of 2,000 sq. miles. Near lake Michigan on the n. the surface is broken into sand-hills, covered with stunted oaks and pines, but the land a few miles back from the shore is of a very fine quality. The principal streams which flow into the Ohio from Indiana are the Laughery, Indian, Kentucky, Silver, Indian Blue, Big Pigeon, and Little Pigeon, none of which are navigable. The Whitewater, in the e. part of the state, joins the Miami 6 m. above the point where the latter flows into the Ohio. The Wabash rises in Ohio, flows through the state for a distance of more than 500 m., and empties into the Ohio. It has been navigated about 300 m. from its mouth. Tributary to it are Salamonie, Mississinewa, Wildcat, Sugar or Rock, Raccoon, Patoka, Vermilion, Eel, Little, and White rivers, the latter having its source near the Ohio line. The Maumee is formed in Allen co., in the n.e. section of the state, by the junction of the St. Mary's from the s. and the St. Joseph's from the n., and flows in a n.e. direction through Ohio to lake Erie. The Kankakee, one of the constituents of the Illinois, flows a distance of 100 m. through the n.w. portion of the state. There is also another St. Joseph's in the n.w. part of the state, which rises in Michigan and returns to that state. Lakes and ponds are numerous in the state, most of them n. of the Wabash. Some of them have no outlets; their waters are clear and their shores and bottoms sandy. Beaver lake, near the Illinois line, which once covered an area of 10,000 acres, has mostly been drained off. Bituminous coal of three distinct varieties is found in the state in great abundance. The measures cover an area of nearly 6,500 sq. m. in the s.w. part of the state, extending from Warren co. on the n. to the Ohio river on the s., a distance of 150 miles. The total depth of the measures is from 600 to 800 ft., and they present from 12 to 14 distinct seams, the latter ranging from 1 ft. to 11 ft. in thickness. The celebrated block coal, which is used in its raw state for making pig-iron and is peculiarly suited to metallurgical purposes, is found in the s. zone of the coal measures. It is taken out of the mines in blocks weighing a ton or more. In Daviess co. there is a seam of superior cannel coal. Peat exists also in the n. part of the state; also bog-iron ore, suitable for mixing with the purer ores of Missouri. Quarries of building stone are estimated to cover an area of more than 200 sq. miles. The stone is of great variety in color and grade and of enduring strength. The product of the quarries in 1879 amounted to \$500,000. Fire-clays exist also in great abundance. Salt springs are found on the e. border of the coal formation. In Crawford co., in the s. part of the state, is Wyandotte cave, which is only a less interesting phenomenon than the Mammoth cave of Kentucky. The climate of Indiana is marked by extremes and sudden changes. The winds in winter, sweeping over wide spaces without obstruction, are cold and piercing, but they temper the heats of summer. The mean temperature of the year is 52°, of the winter 31°, of spring 51°, of summer 76°, of autumn 55°. Only a small proportion of the land is unavailable for cultivation; one-third of the state is in forest, and one-eighth in prairie. The best lands are the bottoms on the Wabash, White, and Whitewater rivers. Among the forest trees are the oak, beech, sugar-maple, hickory, ash, black walnut, poplar, and sycamore.

As an agricultural state Indiana ranks high. The chief productions are wheat, corn, rye, oats, barley, buckwheat, peas, beans, potatoes, grass, clover-seed, fruit, flax-seed, flax, hemp, hay, tobacco, wool, hops, beef, bacon, pork in bulk, lard, butter, cheese, milk, maple-sugar, maple molasses, sorghum molasses, honey, wax, wine, cider, vinegar, horses, mules, asses, sheep, swine, milk cows, working oxen, and other cattle. Some of the products in 1873 are reported as follows: wheat, 22,149,527 bush.; corn, 81,185,485 bush.; barley, 11,434,628 bush.; fruit, 3,473,161 bush.; tobacco, 12,377,182 lbs.; wool, 2,228,437 lbs.; beef, 3,320,067 lbs.; bacon, 40,716,539 lbs.; pork in bulk, 40,716,539 lbs.; maple-sugar, 302,041 lbs.; wine, 827,480 gall.; cider, 1,097,019 gall.; horses, 514,428; sheep, 1,235,874; swine, 2,999,139; cattle, 1,211,246. The wheat crop of 1879 was estimated at 55,000,000 bushels. The census of 1870 reports the number of farms at 161,289; 55,614 of which contained from 20 to 50 acres each, 52,614 from 50 to 100 acres, 29,423 from 100 to 500 acres, and 1004 from 500 to 1000 acres, while 76 contained upwards of 1000 acres. The cash value of these farms was estimated to be \$634,804,189; value of farming implements, \$17,676,591; farm wages paid (with board), \$9,675,348; total value of all farm productions, \$122,914,302; value of orchard products, \$2,858,086; home manufactures, \$605,639; animals slaughtered and sold for slaughter, \$39,246,962; forest products, \$2,645,679; live stock, \$83,776,702. Coal mined in 1873, 570,382 tons; lime made, 1,167,661 bushels.

Indiana has but one port, Michigan City, on lake Michigan, and no direct foreign commerce: its internal trade by means of its rivers, canals, and railroads, is of vast extent. Evansville, on the Ohio, is a port of delivery of the United States and a place of considerable business. In 1873 there were 3,544 m. of railway track in the state. The most important of the roads are the following: Louisville, New Albany, and Chicago, 288 m.; Ohio and Mississippi, 225; Evansville and Crawfordsville, 109; Fort Wayne, Muncie, and Cincinnati, 108; Indianapolis, Cincinnati, and Lafayette, 158; Indianapolis, Peru, and Chicago, 161; Indianapolis and Vincennes, 116; Jeffersonville, Madison, and Indianapolis, 110; Pittsburg, Fort Wayne, and Chicago, 156; Toledo, Wabash, and

Western, 166. The longest canal in the United States is the Wabash and Erie, connecting the Maumee river at Toledo with Evansville on the Ohio. It is 467 m. long, and its course for 374 m. is in Indiana. The Whitewater canal extends from Lawrenceburg on the Ohio to Hayestown, 75 miles. Neither of these canals is much used. There were in the state, in 1873, 6,943 m. of telegraph, the assessed value of which was \$807,874.

The number of national banks in 1873 was 92, with a capital of \$17,611,800, and an outstanding circulation of \$14,536,015. There were in the state at the same date 125 insurance companies, the gross receipts of which for six months ending July 1, 1873, amounted to \$1,169,413. The total valuation of real and personal property in the state in 1873 was \$950,467,854. The state debt at the same date was \$4,898,657.

The number of manufacturing establishments in 1870 was 11,847, employing 58,852 persons, of whom 54,412 were males above 16 years of age, and 2,272 females above 15; while 2,168, including both sexes, were below 16; capital invested in these establishments, \$52,052,425; wages paid in 1870, \$18,366,780; value of products, \$108,617,278. The chief branches of manufactures are agricultural implements, boots and shoes, carriages and wagons, railroad cars, clothing, flour, furniture, iron, leather, lumber, liquors, machinery, pork-packing, saddlery, woolen goods, tin, copper, and sheet-iron ware.

The legislature, which meets biennially, is composed of a senate of 50 members, elected for four years, and a house of representatives of 100 members, elected for two years. The governor and lieutenant-governor are elected for four years, the former having a salary of \$8,000 a year. Members of the legislature are paid \$8 per day during the session. The supreme court consists of five judges, elected by the people for a term of six years, and receiving an annual salary of \$4,000 each. The circuit judges, 38 in number, are elected by the people for terms of six years, and receive salaries of \$2,500 each. The law provides for a superior court of three judges, elected for a term of four years, in any county containing a city of 40,000 inhabitants. Marion co., containing Indianapolis, the state capital, is the only one to which this provision is applicable. Every male citizen of the age of 21 years, who has resided in the state six months, has the right to vote. Women are eligible to any office in the gift of the governor or the legislature. The divorce laws, which were formerly very elastic, are now more strict. Divorce is allowed for seven different causes, including cruel and inhuman treatment, habitual drunkenness, and failure of the husband for two years to make provision for the support of his family.

The principal public institutions supported wholly or partly by the state are the hospital for the insane, and the institutions for the deaf and dumb and the blind at Indianapolis; the house of refuge at Plainfield; the soldiers' home at Knightstown; the northern state-prison at Michigan City, and the southern state-prison at Jeffersonville; the reformatory institution for women and girls in Indianapolis; the normal school in Terre Haute; the state university at Bloomington; and the agricultural college at Lafayette. An act was passed in 1879 to provide for the organization and support of the feeble-minded.

The state board of education is composed of the governor, the superintendent of public instruction, the presidents of the state university and the normal school, and the school superintendents of the three largest cities in the state. The common schools are under the immediate supervision of the state and county superintendents, and the trustees of educational affairs in cities and towns. Instruction is afforded without charge for tuition to all persons between 6 and 21 years of age; separate schools being provided for negroes. The permanent common school fund of the state amounted in 1874 to \$8,616,931, yielding an annual income of \$189,455. Besides this there is an annual poll-tax and a property tax of 16 cents on the \$100 for school purposes. The income from these sources, added to the interest on the permanent fund, swelled the amount of school revenues in 1873 to \$2,276,569. The whole school population of the state in 1872 was estimated at 640,332; the number of pupils enrolled was 465,154, of whom 13,895 were in high schools; average attendance, 293,851; number of teachers employed, of whom a majority were males, 12,056; total valuation of school property in 1872, \$9,199,480. In 1879 the school population of the state was 707,845; average daily attendance, 312,143; number of teachers, 13,490; total school revenue, \$4,902,163; value of permanent school property, \$12,000,000. Besides the state university and the agricultural college, there are 16 institutions of learning that have no connection with the state. The most important of these are the university of Notre Dame (Roman Catholic), the North-western Christian university (Disciples), Asbury university (Methodist), Earlham college (Friends), Wabash college (Presbyterian), St. Mary's academy at Notre Dame, Logansport female college, De Pauw college at New Albany, and the Indianapolis institute afford superior instruction for girls. The total number of educational institutions in the state in 1870 was 9,073, with 11,652 teachers, of whom 4,974 were females; and 464,477 pupils. The number of libraries in 1870 was 5,301, containing 1,125,553 volumes. The most important of these are the state library at Indianapolis, and the libraries of Wabash college, Notre Dame university, Hanover college, State university, and the North-western Christian university. According to the census of 1870 there were in the state 295 newspapers and periodicals, with an aggregate circulation of 363,542 copies. Of these publications 20 were daily, 3 tri-weekly, 1 semi-weekly, and 233 weekly, 6 semi-monthly, 2 monthly, and 2 bi-monthly. The religious organizations at the same time numbered 3,698; the church edifices 3,106; value of church property, \$11,942,227. The principal religious denominations were the Baptist, Christian, Congregational, Episcopal, Friends, Lutheran, Methodist, Presbyterian, Re-

formed (Dutch, and German), Roman Catholic, United Brethren in Christ, and Universalist.

The electoral votes of Indiana for president and vice-president have been cast as follows:—1816, 3 for Monroe and Tompkins; 1820, 3 for Monroe and Tompkins; 1824, 5 for Jackson and Calhoun; 1828, 5 for Jackson and Calhoun; 1832, 9 for Jackson and Van Buren; 1836, 9 for Harrison and Granger; 1840, 9 for Harrison and Tyler; 1844, 12 for Polk and Dallas; 1848, 12 for Cass and Butler; 1852, 13 for Pierce and King; 1856, 13 for Buchanan and Breckinridge; 1860, 13 for Lincoln and Hamlin; 1864, 12 for Lincoln and Johnson; 1868, 13 for Grant and Colfax; 1872, 15 for Grant and Wilson; 1876, 15 for Tilden and Hendricks; 1880, 15 for Garfield and Arthur.

INDIANA, a co. of w. central Pennsylvania, 770 sq. m.; pop. '70, 36,138. It is drained by the Mahoning, Black Lick, and Two Lick creeks. The surface is hilly and covered with forests, chiefly white pine. The soil is generally fertile. The staple products are wheat, oats, buckwheat, maize, hay, and cattle. Mines of bituminous coal and iron ore, and salt-springs, are numerous. There are many manufactories, flour mills, tanneries, saw and planing mills. Cap., Indiana.

INDIANA ASBURY UNIVERSITY, at Greencastle, Putnam co., Ind., a Methodist institution, was organized in 1835. Number of instructors in 1878, 17; of students, 364. President, Alexander Martin, D.D., LL.D.

INDIANAPOLIS (*ante*), was selected in 1820 as the seat of government, and made the capital of the state in 1824. Pop. '80, 76,200. It is situated on a plain on the e. bank of the river. From a small park in the center four broad avenues diverge, intersecting the streets, which are very wide and run at right angles. The streets are generally graveled, but many are paved with stone or wood, and all lighted with gas. Nine bridges, all but one of iron, three of which are for railroad trains, cross the river here. The street railroads have 50 cars. There are 7 parks; that in the n. part of the city containing 100 acres. Thirteen railroads center here which, with their numerous branches, traverse the state, and connect its rich agricultural and mineral districts with the chief cities of the west. A belt-line around the city was commenced in 1875 for the purpose of connecting all the other lines. Eighty-two passenger trains, with over 300 cars, daily leave and enter the union depot, with an average of 10,000 persons, and the number of freight cars entering and leaving in 1874 was above 700,000. There are two large grain elevators, 10 flouring mills, and 8 pork-packing establishments. The manufactures of the city are varied and extensive, having 2 iron rolling mills, 20 foundries and machine-shops, ear-works, factories for agricultural implements, sewing-machines, organs, pianos, carriages, household and school furniture, sash, blinds, glass, starch, glue, cotton and woolen goods, wooden ware, etc. The number of incorporated manufacturing institutions is 30, with an invested capital of \$15,000,000. There is an efficient fire department, with 7 engines and a complete fire-alarm telegraph. The city is abundantly supplied with water by the Holly system. There are 6 national, several private, and 2 savings banks, many insurance companies, 70 churches, state asylums for the deaf and dumb, blind, and insane, a university, 2 medical colleges, a law school, a Roman Catholic theological seminary, a city hospital, an art school, an academy of music, a state library with 15,000 volumes, and a free city library with 14,500, a splendid court house, an exposition building, a chamber of commerce building, Odd Fellows' and Masonic halls, the union depot, U. S. arsenal, and many other fine massive buildings. A new state house, to cost \$4,000,000, has been authorized by the legislature. The city has a well-organized system of public schools, containing over 20,000 pupils, a high school and a normal school. The public schools are supported from the state school fund of \$8,000,000, and by state and local taxation.

The sales of real estate in 1873 amounted to \$32,579,253. The taxable value of property in '73 was \$65,000,000. The city was incorporated in 1836.

INDIAN ARCHIPELAGO. See MALAY ARCHIPELAGO, *ante*.

INDIANA UNIVERSITY, at Bloomington, Monroe co., Ind.; unsectarian; founded in 1828. Professors in 1878, 16; students, 141. Lemuel Moss, D.D., president.

INDIAN CRESS. See TROPÆOLUM, *ante*.

INDIAN CUCUMBER, *Medeola Virginica*, a member of the lily family growing in rich damp woods, from Canada to Florida. It is a perennial herb with a simple slender stem from 1 to 3 ft. high, covered with a flocculent, deciduous wool, and rising from a horizontal white root-stock resembling a cucumber in form, and having a similar taste. The stem bears near its middle a whorl of from 5 to 9 obovate-lanceolate, parallel-ribbed thin leaves, and another whorl of 3 (sometimes 4 or 5) leaves at the top, within which there is a sessile umbel of small, recurved flowers having 3 sepals and 3 petals, 6 stamens. Berry globose and of a dark purple, 3-celled, few-seeded. The botanical name is from Medea, the sorceress, because of supposed medicinal virtues.

INDIAN DYE. See Puccoon.

INDIAN HEMP. See HASHISH, HEMP, INDIAN, *ante*.

INDIANOLA, capital of Calhoun co., Texas, a port of entry on the w. shore of Matagorda bay, 14 m. from the gulf of Mexico, and 120 m. s.w. of Galveston; pop. '70, 1900. It is the terminus of the Gulf, Western Texas, and Pacific railroad. It has a

large and commodious harbor. Steamers sail regularly to Galveston, Corpus Christi, New Orleans, and New York, and the commerce is important. Cattle are the chief article of export. The town has a weekly newspaper and 2 banks. Sept. 15, 1875, the coast was visited by a severe storm of five days, when Indianola was submerged and nearly destroyed.

INDIAN POKE. See *HELLEBORE*, *ante*.

INDIAN RIVER, a tidal inlet of Florida, in Brevard and Volusia counties, running nearly parallel with and near the coast. Its length is 100 miles. Its width varies, the inlet in some parts expanding into large lakes or lagoons, and its depth admitting vessels drawing 5 feet. It communicates by canal with Halifax river, and continues southward to St. Lucie sound. The climate being healthful and the scenery beautiful, it is a resort for invalids.

INDIANS, AMERICAN (*ante*). The early English and French settlers of North America were often at war with the Indians, either in self-defense or instigated by a desire for their lands. In Virginia the Indians who had combined to exterminate the whites were subdued after a ten years' war. In New England (1637) the colonists of Connecticut and Massachusetts destroyed the warlike Pequods, and in 1643 the Narragansetts. The war of Philip, king of the Wampanoags, ended, 1676, in the almost total destruction of that tribe. The Dutch in New Amsterdam and the English in North and South Carolina suffered greatly from the Indians. In the seven years' war between the English and the French the Indians were used by both sides, and terrible atrocities were committed. In 1763 a number of tribes were united under Pontiac, the chief of the Ottawas, in a general conspiracy to exterminate their conquerors, but were finally subdued. When the American revolution began the Indians, who were allies of the English, ravaged the frontiers. The United States, by the constitution of 1787, claiming sovereignty over the whole territory, made treaties with the Indians for the purpose of obtaining their lands; but in 1790 the Miamis and other tribes conspired and defeated the army under gen. Harmar, and the following year under gen. St. Clair, but were subdued by gen. Wayne. In 1811 they recommenced hostilities under Tecumseh, but were defeated at Tippecanoe by gen. Harrison, who also, in 1812, defeated the combined forces of the English and Indians, and killed Tecumseh. In the s. the Creeks were conquered by Jackson in 1813, and the Seminoles of Florida in 1817. In 1832 the Sacs and Foxes, under their chief Black Hawk, harassed the frontier settlements, and from time to time the Sioux, the Comanches, and Apaches, often joined by other tribes, have given the government great trouble.

In 1838 the Cherokees and Creeks were removed from Georgia to the Indian territory w. of the Mississippi, which the government had established to be the permanent home for all the Indians. The Seminoles of Florida refusing to remove, a bloody war ensued, which lasted seven years and cost \$15,000,000. After the removal of the Choctaws, Creeks, and other tribes to the Indian territory, other reservations were formed in several states. In 1871 there were on reservations 237,478, which, added to 60,000 in Alaska, and about 50,000 others not yet placed in reservations, make the total number of Indians in the United States, as estimated by the Indian department, 350,000. The number in the British colonies is estimated at 150,000.

The five civilized tribes of the Indian territory had under cultivation (1879) 237,000 acres, on which they raised over 3,000,000 bush. of cereals, and were engaged largely in the raising of stock. The Indians on other reservations had under cultivation 157,953 acres, and raised over 1,500,000 bush., and all together about 235,000 tons of hay. The Indians are scattered over a large extent of country, and the difficulty of managing them is increased by the attempts of bold and unscrupulous white men to invade their reservations for trade, which often involves fraud, and for the sake of the mineral deposits known to be there. The Utes in Colorado and Apaches in New Mexico, especially, have given the government much trouble. The Utes are fierce and warlike, and resist all efforts to induce them to abandon their wandering life and cultivate the soil.

Earnest attempts have been made at different periods by individuals and societies to Christianize and civilize the Indians, some of which have been remarkably successful. The French and Spanish, in connection with their colonies, had missions among the Iroquois, Chippewas, Creeks, and other tribes. In Florida, Texas, New Mexico, and California, they had prosperous missions. In 1643 Thomas Mayhew labored with success for three years at Martha's Vineyard, Mass., followed in the same work by his father, and by others of the family for five generations. In 1646 the legislature of Massachusetts passed an act for the propagation of the gospel among the Indians, and in the same year John Eliot began his labors at Nonantum, churches were formed, and the Bible and other Christian books translated. The Brainards labored with effect in New Jersey and Pennsylvania. The Moravians and Friends have been active in instructing the Indians. The various Protestant denominations, through organized societies, have had for many years missions among the Cherokees, Choctaws, Ottawas, Chickasaws, Creeks, Dacotahs, and some other tribes, instructing them not only in religion, but also in the arts of civilized life. The Indian problem, always troublesome to the U. S. government, is now seen to involve grave moral and political issues not at first recognized.

The governmental policy has been one of expediency rather than justice. Treaties have been made with the tribes as with sovereign nations, but have been set aside on easy pretexts. Indians have not been considered as citizens under the law: their ownership of property, as recognized, has been tribal and not individual. They have been allowed to be the prey of rapacious speculators in land, and thievish traders. Of late years the government has sought to apply a better policy, but the evil has been found too vast and deep for easy reform; and a wave of popular feeling is now rising, bearing in upon the government with strong demands in different directions. There are signs that the discussion will result in better processes of dealing with the Indians, and that the government will find or make its way to a system that shall be wise and just. See INDIAN TERRITORY.

INDIAN TERRITORY (*ante*), the home of civilized or partially civilized remnants of once powerful aboriginal tribes, removed by the government from time to time from different parts of the union, and which, upon separate reservations and under forms of government established by themselves, are living at peace with each other and with the United States. In June, 1830, congress passed an act setting apart "all that part of the United States w. of the Mississippi, and not within the states of Missouri and Louisiana or the territory of Arkansas," to be known as the Indian country. The region thus described formed a part of the Louisiana purchase of 1803 from France. Portions thereof have since been organized into new states and territories, and only a remnant of the original Indian country now remains. To it has been added, however, a narrow adjoining strip of land w. of the 100th meridian which was ceded to the United States by Texas.

The territory contains 20 reservations, the names of which, with the extent of each in sq. m., are as follows:—Arapahoe and Cheyenne, 6,715; Cherokee, 7,861; Chickasaw, 7,267; Choctaw, 10,450; Creek, 5,024; Kansas, 154½; Kiowa and Comanche, 4,369; Modoc, 6; Osage, 2,291; Ottawa, 23½; Pawnee, 442; Peoria, 78½; Pottawatomie, 900; Quapaw, 88½; Sac and Fox, 750; Seminole, 312½; Seneca, 81; Shawnee, 21; Wichita, 1162; Wyandotte, 38½; total area appropriated, 47,039 sq. m.; unassigned, about 22,000 sq. miles.

White speculators and adventurers have often attempted to enter the territory and appropriate the lands not included in the reservations, but the government of the United States, in fulfillment of its treaty stipulations to the Indians, has prevented them. The latest movement of this kind was made in 1879, when the president issued his proclamation warning those engaged therein to desist, and informing them that if they should enter the territory they would be expelled, if necessary, by an armed force. A bill was lately introduced in congress to erect the Indian country into a regular territory of the United States, thus opening its unsettled lands to the whites and subjecting the Indians to the very encroachments to avoid which they consented to go upon the reservations. It has been proposed in some quarters to make the Indians citizens, to place them under territorial government, and finally admit them as a state to the union. But to this plan there are some serious obstacles, not the least of which is the unwillingness of the Indians themselves to sacrifice the autonomy of their respective tribes and the governments of their own already existing. Though this may ultimately be arrived at, it is not easy to see how the government of the United States could suddenly force such a change upon them without violating the most solemn treaty obligations.

The population of the territory, exclusive of white residents, is reported to number 74,140. The number of whites legally there is about 12,000, and besides them there are 3,000 others who would be excluded if the law were strictly enforced.

Agents representing the United States live among the various tribes, exercising a paternal oversight of their affairs, and protecting them from encroachments. They are appointed by the president with the consent of the senate, and, under existing regulations of the Indian bureau, are nominated by the religious denominations which have missions among the tribes. Each tribe has its own internal government, but the United States courts have jurisdiction in civil actions where a white man is a party, in cases of crime against a white man, and of violations of the laws regulating trade and intercourse with the Indians.

It appears from the report of the commissioner of Indian affairs for 1873 that there were then in the territory 217,790 acres of cultivated land, producing in that year 1,299,952 bush. of corn; 92,574 of wheat; 60,750 of oats; 198,740 of potatoes; 5,000 of barley; 6,500 of turnips; 138,745 tons of hay; 5,000 bales of cotton; and 4,000 lbs. of sugar. Furs were sold to the value of \$193,560; and 3,930,468 ft. of lumber were sawed. The number of live stock was—horses, 212,153; cattle, 322,354; sheep, 13,100; swine, 430,445; total value, \$9,408,187. In 1879 the number of acres of cultivated land had increased to 237,000, producing 565,400 bush. of wheat; 2,015,000 of corn; 200,500 of oats and barley; 336,700 of vegetables; and 48,353 tons of hay.

There are more than 200 common schools and ten high schools in the territory, and in the former over 6,000 children. Nearly all the tribes have abandoned their pagan religions. The traffic in ardent spirits is absolutely prohibited, and no other territory of the United States contains so many houses of worship, or so many Sunday-schools, with so numerous an attendance, as are found in this. See INDIANS, AMERICAN.

INDIAN TOBACCO. See LOBELIA, *ante*.

INDICTMENT (*ante*). In the United States persons accused of felonies or grave misdemeanors can be brought to trial only upon an indictment which a grand jury has declared to be "a true bill." When a criminal court is convened and the grand jury has been duly constituted and instructed, the state's attorney, or some other duly qualified officer, lays before them draughts of indictment against the alleged offenders, and furnishes them with the names of the witnesses whose testimony is relied upon to support the accusation. These witnesses the grand jury examines *ex parte*, not to determine the guilt or innocence of the accused, but to ascertain whether there is or is not *prima facie* evidence of guilt sufficient to warrant their trial. If twelve or more members of the grand jury pronounce in the affirmative, the presentment, with the words "a true bill" indorsed upon the back thereof, is sent to the court; and upon the charges therein contained, carefully set forth in the indictment subsequently prepared, the accused is put upon trial before a petit jury. The indictment is prefaced by a "caption," in which are set forth the name, term, and place of meeting of the court, the names of the justices, and the fact that the grand jury was lawfully constituted. Then comes a full and particular description of the alleged crime; the name of the accused must be given if known; and if not, he must be described in such a way as to make his identity sure. The time and place of the commission of the crime must also be stated, though it is not always necessary to conviction that these particulars should be exactly supported as charged. In some cases, however, a failure upon this point is fatal to the indictment. In trials for perjury the exact day when the offense was committed must be named. To prove that the crime was committed on some other day will not avail. In cases of murder the death must be described as occurring within a year and a day of the time when the alleged fatal injury was inflicted. When several persons have been concerned in the commission of a crime, they may be indicted either jointly or separately. It is usual to describe the alleged offense in different ways, in what are usually called "counts," in order to cover any uncertainty that may exist beforehand as to the precise way in which it was committed. It is enough if the prisoner is convicted upon a single count. The indictment must charge explicitly whatever is necessary to constitute the offense. In many of the states of the American union the harsh rule of the common law, which denied the right of a person accused of treason or felony to have a copy of the indictment, has been abolished by statute.

INDIUM, a metal discovered in 1863 by spectrum analysis, in the zinc blende of Freiberg, by Richter and Reich. It is named from two indigo-colored lines in the spectrum. It has also been found in the black blende of Saxony (christophite), in the wolfram of Linnwald, and in blende of Maine. It may be prepared from crude metallic zinc, or from the deposits in galvanic batteries, by dissolving them in nitric acid and treating the filtrate with ammonia, which precipitates the oxide of indium; this is reduced to the metallic state by hydrogen or potassium cyanide. Indium has a sp. gr. of 7.421. Its atomic weight is 113.4. Its melting point is 349° F. It is not easily oxidized, even above the point of fusion. The pure metal has a bluish silvery luster somewhat like lead, which it also resembles in softness and ductility. The principal compounds have the following formula:

Chloride.....	InCl ₃ .
Yellow oxide.....	In ₂ O ₃ .
Hydroxide.....	InH ₃ O ₃ .
Nitrate.....	In3NO ₃ .
Sulphate.....	In ₂ SO ₄ +9H ₂ O.

INDIVIDUALITY, the quality of being individual: separate or distinct existence. There is some difference of opinion as to what constitutes individuality, the discussion being principally confined to the domain of natural history. Some authorities regard the various organisms springing by buds from a single hydroid as an individual. Others again consider various parts of a tree to be individuals. The question cannot be settled without looking at it from two points of view. In one sense all the organisms proceeding from one egg may be considered as comprising one individual, being derived from one germ, the production of the zooids by budding being similar to the development of a stock by grafting; but similar only because, in grafting, a part of one individual, and not a germinal part, is inserted into another, and there proceeds to grow, as though the original plant extended itself. But in the budding of hydroids the different zooids thus produced exactly resemble each other, depart from each other, and develop independently into hydroids like their parent; and some may develop much more rapidly than others. The production of a zooid is more like original germination or ovum development than the growth and extension of a part of the common tissues of a parent. In one sense the new tree which has grown from the stock of another is a part of that tree; but in another, and probably a more exact sense, it is another and entirely independent tree—a separate individual. A tree, taken as a whole, whether while putting out its leaves, or in bloom, or bearing ripe seed, is an individual, while each ripe seed may be regarded as potentially an individual. If it fall upon the earth and sprout it becomes an individual tree, like its parent. It might be said that the acorn does not become an individual in a strict sense until it becomes a tree; but it may be held logical to consider that it became an individual as soon as it became a perfectly developed seed.

If we do not look at the subject in this way we shall be obliged to regard all objects in nature as mere fragments of one great whole, which in a spiritual sense is true; but the application of metaphysical methods to natural science only leads to confusion. Each leaf of a plant is certainly an individual leaf, but in a true sense it is not an individual, for it can have no independent existence; it is only a part of a compound organ of respiration of plant life, and may be compared to a pulmonary vesicle of the lung of an animal.

In the case of the Siamese twins, they are, doubtless, correctly regarded as two individuals, and yet in so far as their livers, which seem to have been united, were really combined and performed their functions in union, they were not quite distinct individuals. They must have possessed individual minds, and, in the higher sense, were entirely distinct individuals. Other monsters have been born having two heads and only one body. It would not be logical to regard such, taken as a whole, as being distinct individuals, each brain being dependent upon a common body. In one sense the organism comprises two individuals, but in another it does not. If such a monster could live, the two brains could not be independent in function of each other. Individuality is, therefore, to a certain degree, a relative term, and the use of the term sometimes requires explanation. This is one of those questions in which is illustrated the dependence of physical upon metaphysical science.

INDIVISIBLES, in mathematics. According to the theory of indivisibles, volumes are composed of an infinite number of planes, planes of an infinite number of lines, and lines of an infinite number of points. The point, then, is the indivisible element to which all magnitudes can be reduced—the atom of mathematics. By the method of indivisibles, as developed by geometers of the middle ages, some of the problems to which the method of infinitesimals is now applicable were successfully solved.

INDO-CHINA (FARTHER INDIA), or the **INDO CHINESE PENINSULA**. See **SIAM**, **BURMAH**, **COCHIN-CHINA**, *ante*.

INDOSTAN. See **INDIA**, *ante*.

INDRIS. See **LEMUR**, *ante*.

INDUCT, the power of presenting to benefices, granted by the church of Rome to kings and cardinals. When the pragmatic sanction was abolished, 1516, Francis I. of France received the power of nominating to the bishoprics within his realm. The college of cardinals, by an agreement with Paul IV., 1555, have the disposal of the benefices which depend on them.

INDUSTRIAL EXHIBITION. See **EXHIBITION, INDUSTRIAL**, *ante*.

INDUSTRIAL INSTITUTIONS. See **AGRICULTURAL INSTITUTIONS**; **JUVENILE OFFENDERS**.

INEQUALITY. In algebra the relationship existing between two quantities can be expressed either by the sign of equality, as $a = b$, or by the sign of inequality, as $a > b$ and $c < d$, read respectively a is greater than b and c is less than d : the greater quantity—that which more nearly approaches to $+\infty$ —is always opposite the opening of the angle. The first members are a and c ; the second, b and d . When in two inequalities the greater quantity is on the same side of the sign, they subsist in the *same sense*, and when on different sides they subsist in a *contrary sense*.

INES DE CASTRO. See **CASTRO, INES DE**, *ante*.

INFANT (*ante*), in law, is a person held to be too young to assume the full responsibilities of a man or a woman. By some systems of law the age of maturity is fixed at 25 years, but by the English common law the limit is 21 years for both sexes. The marriage of a boy of 14 years to a girl of 12 is held to be legal, and wills of personal property may be made at the same age. A promise to marry is not binding upon the promiser unless he or she is of full age. It has long been a rule of law that a minor becomes of age on the day next preceding the 21st anniversary of his birth. In some American states women reach the period of legal maturity at 18 years of age. An infant's contract will not be enforced by law; he may fulfill it or not as he pleases; but if it is renewed after maturity it is binding. The renewal may even be inferred from his acts, where no specific promise is shown. At his majority he may repudiate it at will; but if he be in possession of the property of the other contractor, he will be compelled to give it up. He will not be allowed to plead "infancy" as an excuse for retaining property not his own. There is, however, one exception to the voidable nature of an infant's contracts; he may bind himself for "necessaries," such as food, clothing, shelter, medical attendance, and the means of education. The limit of his obligation in this respect will be a question for a court and jury to decide in view of his wealth, social position, or other circumstances. If he voluntarily do anything which the law could compel him to do, the act will be valid and sufficient. In some states of the union he can become an executor at 17 years of age, in others not until 21. He is responsible for wrongs of an actionable nature done to others; but the practical application of this principle involves some very nice discriminations for the court. It has been held, for example, in some cases, that an infant who fraudulently represents himself to be of full

age, and thereby obtains property, is estopped from pleading infancy as a bar to an action for its recovery; but the soundness of this position has been questioned. An infant, if sufficiently intelligent, is held responsible for any crime that he may commit. It is a rule of the criminal law that this responsibility can never arise before he is 7 years of age; after that period, until he is 14, the law presumes nothing for or against him; his capacity to understand the nature and consequences of his act is a matter for investigation. After he is 14 he is presumed to be capable, and the burden of proving his incapacity rests upon himself. Courts generally incline to sentence juvenile criminals to reformatory institutions, with a view to the correction or mitigation of their evil propensities. Courts of equity guard the rights of infants with a jealous care, sometimes, for adequate reasons, taking a child from the custody of the parent and placing it in the care of one better qualified to train and educate it. An infant who is a property-holder is amenable to the law of taxation, and his land is liable to be taken from him under the law of eminent domain as if he were of age.

INFANTE, JOSÉ MIGUEL, 1778-1844; b. in Santiago de Chili; a leader of the revolution of 1810, resulting in the independence of Spanish America; was also a member of the "congress of plenipotentiaries" in 1831, and chief-justice in 1843. He took an active part in the establishment of the common-school system.

INFANTRY (*ante*). The term infantry was originally applied to a body of men collected by the *infante* of Spain, for the purpose of rescuing his father from the Moors. The attempt being successful, the term was afterwards applied to foot-soldiers in general, as opposed to cavalry. Among the ancient nations of Europe the foot-soldiers constituted the chief strength of the armies. In the best days of the Grecian and Roman states, battles were won mainly by the force and discipline of the phalanges and legions, and the number of the infantry in the field far exceeded that of the cavalry. The cavalry were then, as at present, employed chiefly in protecting the wings of the army and in completing a victory gained by the infantry. The ancient Franks, when they left the forests of Germany, were accustomed to march and fight on foot; and they persevered in this practice even after they had obtained possession of the country of the Gauls, which abounded with horses. But soon after the time of Charlemagne the institutions of chivalry began to be generally adopted in the kingdoms of Europe. These led to frequent exhibitions of martial exercises on horseback in presence of the sovereigns and assembled nobles; and the interest inspired by the achievements of the knights on those occasions was naturally followed by a high regard for that order of men. By degrees the cavalry, which was composed of persons possessing rank and property, and completely armed, acquired the reputation of being the principal arm in war; and the foot-soldiers, badly armed and disciplined, were held in comparatively small estimation. This continued 400 years, and although war was the principal occupation of mankind, military science fell into neglect. But rulers were forced by the power of feudalism to make an alliance with the despised class of foot-soldiers, and in 1214 we find that some of the German infantry was recognized to be "very good, and trained to fight on the level even against cavalry." The chivalry of France was routed at Courtrai by the infantry during the next century, and the Austrians suffered defeat by the efficient work of the Swiss pike at Morgarten (1315), Sempach (1386), and Nafels (1388). At Cressy and Poitiers (1346-56) the knights of England dismounted to fight beside the successful infantry. The principal weapons of the infantry before the invention of gunpowder were long-bows, halberds, cross-bows, spiked clubs, axes, pikes, straight swords, shields, corselets, mail-jackets, helmets, and partisans. In the 16th c., however, these weapons were replaced by fire-arms, and in the 18th c. the musket was in general use. It became customary during the thirty years' war to form battalions of infantry composed of 500 men, which were massed into dense columns during battle, in spite of the deadly effect of the enemy's artillery and fire-arms. The absurdity of this formation was first exposed by Gustav Adolph, who, recognizing the destructiveness of fire-arms, arranged his battalions with a view to increasing the effectiveness of the fire of his own troops, while avoiding exposure to that from the enemy. His tactics were so successful at Breitenfeld and Lutzen (1631-32) that they were soon afterwards universally adopted. The bayonet came into use in 1670, and the socket-bayonet about 1699. Frederick the great made many improvements till then comparatively unknown. The rapidity with which his infantry troops performed their evolutions during battle contributed largely toward his famous victories in the seven years' war. In fact the Prussian infantry have ever since his time served as models for other European countries. The superiority of this arm consists in the troops being able to act on ground where cavalry cannot, and it is obvious that the latter must be nearly useless in the attack of fortified towns. During the war of the rebellion in this country skirmishing was in vogue in the northern and southern armies. It had been in use during the revolutionary war, and was well suited to the American character. Skirmishing has since been adopted in Prussia, and the skirmish line is recognized as the proper formation in battle to avoid the destructive effect of breech-loaders. The co-operation, however, of cavalry and infantry troops was neglected by American generals. Artillery fire usually opened the battle, and was followed by the advance of the whole line on the run in a final charge. The infantry tactics in general use were those of Casey, founded on those of Scott. Casey's tactics,

however, were abandoned for those of Hardee, and in 1867 those of Upton were finally adopted.

Pursuant to the act of congress of Aug. 15, 1876, the army of the United States was reduced to a maximum of 25,000 men, and by general orders issued May 19, 1877, the maximum strength of the infantry was fixed at 9,375. This included 37 enlisted men per company for 250 companies of infantry, and 5 for non-commissioned staff at each of 25 regimental head-quarters of infantry.

The arm that has been adopted for the infantry is the Springfield breech-loading rifle, and the uniform for privates is a single-breasted dark blue basque coat, sky-blue trousers, blue cloth cap with a white pompon; for officers, a double-breasted frock-coat of dark blue cloth, and light blue trousers with black stripes. The overcoat is a dark blue double-breasted surtout. The equipments are a knapsack with great-coat straps, a haversack, a canteen, a cartridge box, and a bayonet scabbard. The pay of the United States infantry is as follows: Col., \$3,500 per annum; lieut. col., \$3,000; maj., \$2,500; capt., \$1,800; adj., \$1,800; regimental quartermaster, \$1,800; first lieut., \$1,500; second lieut., \$1,400; chaplain, \$1,500; first serg., \$22 per month; serg., \$17; corp., \$15; private, \$13. An increase of 10 per cent is allowed for every five years' service, provided the total amount of increase does not exceed 40 per cent of the whole pay.

INFANZONA'DO, the name of a district in the Spanish province of Biscay, containing 72 villages. It is divided into the five *merindades* of Arratia, Bedia, Busturia, Marquina, and Uribe.

INFIDEL, a name generally applied to one who disbelieves the Bible as a divine revelation, but sometimes used also for a skeptic or doubter, and for him who calls himself a freethinker.

INFLAMMATION (*ante*). It is held by some authorities that during the first stage, when the capillaries are contracted, the circulation is increased in rapidity, and diminished during dilatation; while others hold that it is slower in the first stage and more rapid in the second. This difference of opinion arises in consequence of making the observations under different circumstances. If a capillary be enlarged through its whole length the blood will pass through it, for a short time, more rapidly than is natural, and when constricted it will be slower; but if contracted in some places and dilated in others, the blood will necessarily move more slowly in the dilated places and more rapidly in the contracted places, according to physical laws. But after a while an oscillation will take place, and at last there will be stagnation, and distension with colored corpuscles. Liquor sanguinis then exudes through the walls of the vessels, which are sometimes ruptured, allowing the blood corpuscles to escape. The contraction of the capillaries in the first stage and their dilatation in the second is in consequence of the action of involuntary muscular fibers which are placed around the vessels in a transverse direction, like the involuntary muscular fibers of the intestinal canal. This fact explains the power of the emotions over the capillary system in producing pallor and blushing. Sometimes all the symptoms of inflammation are not present, and sometimes they may all be absent, as in the latent pneumonia of the aged. It is necessary, therefore, for the physician to be very guarded in his diagnosis, particularly if the patient be feeble or old. As to the result of an inflammation, it will depend upon whether the exudation live or die. If it live, it undergoes transformations which depend upon the condition of the system. If the system be healthy, the exudation, if it take place upon a serous membrane, will have a tendency to form fibrous tissue, but on mucous membranes or in areolar tissue the tendency is to the formation of pus corpuscles. When the exudation accompanies inflammation produced by wounds the superficial portion is transformed into pus, while the deeper portion is converted into nucleated fibers, which eventually form a cicatrix or scar. Severe inflammation, such as that which takes place after a compound fracture, is attended by several very decided symptoms, such as marked alternation of heat and chilliness; the pulse is very rapid, the skin and mouth are dry, the urine scanty and high-colored. There is great thirst, and unless relief be procured delirium will soon supervene. Constipation is the rule, but, when the bowels are moved, the discharges are very offensive.

According to the manner of its action inflammation is called healthy or unhealthy; and that which is called healthy is really a natural and not a morbid process, the only pathological product being pus, and that of a character called healthy. The color which inflammation produces in a part depends upon the kind of tissue invaded, and upon the intensity of the action. Ligaments and tendons rarely become red. Fibrous membranes, like the sclerotic coat of the eye, assume a lilac color; the mucous membranes at first become scarlet, then darker, and, if the tissue die, black. Inflammation of serous membranes passes from lilac to scarlet, to brown. The kidneys become violet. Inflammation arrests nutrition and consequently diminishes the amount of tissue in a part, which becomes manifest when the swelling subsides.

The treatment of inflammation has been greatly simplified and improved by the discoveries of modern histology and therapeutics. It is local and general, the former consisting in various applications depending on circumstances. Sometimes warm fomentations are desirable, as affording relief to the nerves of the part, and promoting an interchange of material in the stagnated parts. Sometimes the continued application of

cold is the best remedy to prevent destructive action. Inflammation is sometimes prevented by bandaging or by the application of adhesive straps, but such an operation requires great caution. The study of pathology and experience in practice has shown the impropriety of employing depleting measures in most of the inflammatory conditions, which usually require measures calculated to increase nutrition. Indeed, it is to be borne in mind constantly that recovery from inflammation consists mainly in regeneration or reproduction of tissue. The old tissue must mainly pass away, and the newly formed can be healthy only when developed under the influence of healthy nervous action. Therefore recovery is gradual and requires the repeated renewal of considerable of the tissue of diseased parts. Tonics are often of more service than depletants, and anodynes are of frequent advantage in allaying irritation. Great attention must be paid to the condition of the blood. This vital fluid is naturally alkaline, but often diminishes in this property during inflammation. The alkalinity should be increased by the administration of alkaline medicines, such as the bicarbonates of soda or potash, or both. Wine is often of advantage; also, a nutritious but bland diet. There are conditions of inflammation, however, when decided antiphlogistic measures are indicated, as in violent attacks of pleurisy in robust persons. In such, sometimes the only means of saving the life of the patient is prompt bleeding, together with the administration of opiates, and sometimes mercurials, in no hesitating and doubting manner. Great attention should be paid to ventilation. The purer the air the more rapid will be the recovery. Frequent bathing, generally with tepid water, and all the well-established hygienic measures suitable to the occasion, should not be neglected.

INFORMATION (*ante*), in law. In the U. S. courts actions for minor offenses, such as attempts to evade the revenue laws, etc., sometimes proceed upon information; but no capital or infamous offense can be prosecuted otherwise than by indictment. In several of the states all offenses which are misdemeanors may be prosecuted upon information, but in the case of felonies indictment is necessary. In Pennsylvania and some other states it is optional to proceed by either method. Information is often the form of proceeding in civil cases. By this process a person filling a civil office may be brought into court to show by what authority he assumes to exercise the functions thereof, with a view to his displacement in case it can be shown that his authority is insufficient, and that the office belongs to another. If an unincorporated association assumes corporate powers, it may be ousted by this process, while a legal corporation may be thus arraigned for a violation of its charter or any infraction of law.

INFRALAPSARIANS, or **SUBLAPSARIANS**, in ecclesiastical history are those who hold that God, for his own glory, permitted the fall of man without positively fore-ordaining it. According to this view God determined to create the world, to permit the fall of man, and from the mass of fallen men elect some to eternal life and leave the residue to suffer the just punishment of their sins. Opposed to these are the **Supralapsarians** who hold that the fall of Adam, with all its evil consequences, was predetermined from eternity, that election and reprobation precede the purpose to create and permit the fall. According to this view, God, to manifest his grace and justice, creates some to be saved and others to be lost. The majority of the members of the synod of Dort, composed of delegates from all the reformed churches on the continent and in Great Britain, and of the Westminster assembly, were **Infralapsarians**. Such was Augustine, and such have been those who adopt his system of doctrine.

INGALLS, **RUFTS**, b. Maine, 1820; graduated at the U. S. military academy, 1843; joined the army. In 1845 he was transferred to the dragoons, and in 1848 to the quartermaster department with the rank of capt. In 1854 he became col. and assistant quartermaster-general. In 1860 he was ordered from the frontier, where he had long served as quartermaster with his regiment, to Washington, where, at the beginning of the rebellion, 1861, he was appointed chief quartermaster of the volunteers to provide for the supplies of the army of the Potomac and of the army of the James. He discharged his duties with great ability, fidelity, and promptness. Mar. 13, 1865, he was made maj.gen. of volunteers for meritorious services in the rebellion; and in 1867 became quartermaster of the military division of the Atlantic at New York.

INGAUNI, a tribe dwelling on the mountains and seacoast of Genoa in the 1st and 2d c. B.C. They were active in the wars between the Romans and Ligurians, and were allies of the Carthaginians in the second Punic war. They were regarded as a distinct tribe in the time of Pliny and Strabo, but after the battle with **Emilius Paulus**, 181 B.C., in which they lost 15,000 men, very little was heard of them. The town **Albenga**, then called **Albium Ingaurium**, was their capital.

INGBERT, or **SANCT INGBERT**, a t. of Germany, in Bavaria, in the Palatinate, on the Roorbach, noted for its coal, iron, and quicksilver mines, and the manufacture of iron, glass, and chemicals. Pop. about 9,000.

INGELOW, **JEAN**, b. England, 1830; published her first volume, *Poems*, in 1863, and gave evidence of original talent. Among the poems in this volume, "Divided," "High Tide on the Coast of Lincolnshire," and the "Songs of Seven," have been very popular. Her subsequent poems have sustained her reputation as a highly gifted poet. She has published also several prose works, as *Studies for Stories*; *Home Thoughts and*

Home Scenes; Off the Skelligs, and others. Her verses are characterized by simplicity and naturalness. They have had a very large sale in America. She now resides in London.

INGENIOUSZ, JAN, 1730-99; b. in Holland; studied and practiced medicine in Holland, but removed to London in 1767. Accident brought him an introduction to the Austrian imperial family, whom he served professionally with such success that he was named by the empress Maria Theresa aulic counselor and physician to the imperial family, with a pension of £600 per annum. He devoted much time and study to general scientific research and experiments in electricity, and in regard to the composition and relation of different gases. It is claimed that he made the first medical use of carbonic acid, and that he invented the plate electrical machine. He was greatly esteemed by the emperor Joseph II., and was consulted by the most distinguished personages in Vienna. Ingenhousz wrote a number of scientific treatises and essays, some of which were published separately, and others in the *Journal de Physique* and other periodicals. He practiced inoculation in small-pox with distinguished success, and gained a widespread reputation for his skill in this direction.

INGERMANNLAND, or INGRIA. See ST. PETERSBURG, GOVERNMENT OF, *ante*.

INGERSOLL, a t. of Oxford co., Ontario, Canada, on the Thames river, and on the Great Western railroad, 85 m. w.s.w. of Toronto; pop. '71, 4,022. It exports largely grain and lumber, and has several manufactories of machinery, woolen goods, agricultural implements, cheese, and wooden ware; 2 banks, 7 churches, several hotels, and 2 newspapers. It is a place of growing importance.

INGERSOLL, CHARLES ROBERTS, LL.D., b. Conn., 1821. After graduating at Yale college, 1840, and at the Yale law school, 1844, he practiced law in New Haven. He was several times a member of the general assembly, and in 1873, '74, and '75 was elected by the democratic party governor of the state.

INGERSOLL, JARED, LL.D., 1749-1822; b. Conn.; graduated at Yale in 1768, studied law for five years in London, and after spending a year and a half in Paris, settled in Philadelphia, where he became prominent as a lawyer. In 1789 he was a member of congress, and in 1787 represented Pennsylvania in the convention which framed the constitution of the United States. He was also attorney-general of the state, and at the time of his death was presiding judge of the district court of Philadelphia county.

INGERSOLL, JOSEPH REED, LL.D., D.C.L.; 1786-1868; son of Jared; b. Philadelphia; graduated at the college of New Jersey in 1804, and for many years practiced law in Philadelphia, where he became eminent in his profession. He was a member of congress 1835-37, and again in 1842-49. In 1850-53 he was minister to England. He was an excellent public speaker. Of his published pamphlets the most important was *Secession a Folly and a Crime*, which appeared at the outbreak of the rebellion.

INGERSOLL, ROBERT G., b. Dresden, N. Y., 1833; the youngest of five children of a Congregational minister. The family removed west in 1845, and settled in Illinois, and there Robert studied law; was admitted to the bar, and entered into politics as a democrat. In 1857 he removed to Peoria, where he soon became recognized as an able lawyer, chiefly employed in railroad litigation. In 1860 he was nominated for congress, but was defeated. In 1862 he entered the war as col. of the 11th Illinois cavalry, and was taken prisoner, but exchanged. He returned to citizenship a republican in politics, and was appointed by gov. Oglesby attorney-general of Illinois in 1868. In 1876, at the republican presidential convention at Cincinnati, he electrified the audience, and, through them and by means of the press and the telegraph, impressed the entire country with his fervid and vigorous speech in favor of James G. Blaine. From this time col. Ingersoll was recognized as one of the foremost natural orators of the country. He soon after entered the lecture field, where the matter as well as the manner of his discourse excited public attention. He developed the views of a pronounced opponent to Christianity as a system; and, adopting religious topics as his subjects, attacked the inspired character of the Bible, the personal nature of the Deity, the existence of a hell, with all the force of which he was capable, and with the advantage of rhetorical powers scarcely equalled. There have been few instances of the exercise of freedom of speech in religious matters which could be compared to that of col. Ingersoll. Yet, despite his recognized ability as a dialectician, and his surprising and persuasive gifts of oratory, there has been no evidence that his influence as a controversialist or a skeptic has extended beyond the immediate period of his address. Col. Ingersoll married Miss Eva Parker in 1862, and has two daughters. He has been president of several railroad companies; but, since devoting himself to public lecturing, has resided in Washington.

INGHAM, a co. of Michigan; 576 sq.m.; pop. '70, 25,268. The surface is nearly level; the soil fertile, and coal and iron ore are found. The staple products are grain, maize, oats, wool, hay, and cattle. The chief articles of manufacture in numerous factories are carriages, machinery, brick, saddlery, doors, sash and blinds, furniture, and woolen goods. There are also flour and saw mills and tanneries. Several railroads traverse the co. and center at Lansing. Cap., Mason.

INGHAM, BENJAMIN; 1712-72; b. England. In 1733 he was associated with the two Wesleys, the founders of Methodism, and in 1735 accompanied John Wesley to Georgia. Returning, he visited the Moravians in Germany, and founded in Yorkshire congregations of Moravian Methodists, which in a few years increased to 84. He was afterwards elected a bishop of that church; but finally, with most of the societies which he had formed, joined the Sandemanians.

INGHAM, CHARLES C.; 1796-1863; b. Ireland; distinguished himself as a painter, gaining at the early age of 21 from the Dublin academy the prize for the "Death of Cleopatra." In 1817 he settled in New York, where he excelled as a portrait-painter, and was one of the founders of the national academy of design, of which he was vice-president 1845-50. Among his admired paintings, besides his portraits, are "The Flower Girl," "Day Dream," "The Laughing Girl," and "White Plume."

INGRAHAM, DUNCAN NATHANIEL; b. South Carolina, 1802. Entering the U. S. navy as midshipman in 1812, he became capt. in 1855. Commanding the sloop of war *St. Louis* in the Mediterranean in 1853, he interfered with the arrest, by the Austrian consul at Smyrna, of Martin Koszta, a Hungarian, who had declared in New York his intention of becoming an American citizen. The government approved the course of capt. Ingraham, and congress requested the president to present him a medal. He was made in March, 1856, chief of the bureau of ordnance and hydrography, and held the position until Feb. 4, 1861, when he resigned his commission in the navy, and became chief of ordnance, construction, and repair in the confederate navy.

INGRAHAM, JOSEPH H., 1809-66; b. Maine. After a brief period in mercantile pursuits, he became a teacher in Washington college, near Natchez, Miss. In 1836 he published *The Southseest by a Yankee*, and afterwards *Lafitte; Burton, or the Sieges; Capt. Kyd; The Dancing Feather*, and some other popular romances. Subsequently he was ordained an Episcopal minister, and took charge of a parish and school at Holly Springs, Miss. His last and most important works were *Prince of the House of David*; *Pillar of Fire*; and *Throne of David*, a series of works of fiction based upon the Old and New Testament histories, and intended to illustrate the Bible.

INHALATION, in medicine, a term used to signify the breathing into the lungs of vapors or gases for producing anesthesia, or for more strictly curative purposes. The inhalation may be accomplished in a variety of ways. The ordinary manner of administering chloroform or ether is to fold a napkin in the form of a funnel and moisten the interior with a dram of chloroform or a half ounce of sulphuric ether, and apply it to the nostrils and mouth of the patient, admitting a certain quantity of fresh air at the same time. The napkin may be folded in such a manner as to accomplish this, or it may be occasionally partially removed. The quantity of the anæsthetic may be renewed when necessary. There are various forms of apparatus rendering the operation more certain for those whose experience is not great, and, as a rule, they are to be considered desirable. The inhalation of nitrous oxide gas should always be performed with well-made apparatus, and this substance should be carefully purified before it is taken into the lungs. The steam, or rather the vapor of hot water, is employed in throat diseases, often affording great relief; and medicinal substances, such as iodine, chlorine, and camphor are sometimes used in conjunction, but it is often desirable to use the watery vapor without any combination. A very convenient, and, in the absence of other apparatus, the only available way, is to place a funnel over an open vessel containing hot water, and inhale the hot vapor through the spout. A deep vessel, such as a two quart earthen pitcher, may be used, holding a pint of boiling water—the patient breathing from the open mouth, putting his face close over the vessel, with care to moderate the heat of the contents. The vapor of iodine is often found beneficial in affections of the throat or lungs, and this may be inhaled by using the alcoholic tincture, or the solid substance may be put into a wide-mouth bottle, from which the patient may inhale the vapor, which, if the quantity is sufficient, will be afforded rapidly enough at ordinary temperature. If the quantity used is small, it may be slightly warmed. The vapor of carbolic acid is often beneficial as an inhalant, and may be administered in a similar manner. There are various kinds of apparatus for inhalation, with the common object of introducing vapor to the lungs in the proper strength or temperature, and due admixture of air.

INHAMBAN', or **INHAMBÁNA**, a Portuguese of East Africa, 200 m. n.e. of Delagoa bay, and near the mouth of the Inhamban river; pop. 6,500. It exports wax, ivory, copal, oilnuts, and india-rubber.

INHIBITION, in physiology. See **NERVOUS SYSTEM**.

INJUNCTION (*ante*), in legal practice, a writ of a court with equity jurisdiction, addressed to a party or parties defendant, commanding the performance or non-performance of some specific act. It is either prohibitory or mandatory; in the one case forbidding a certain act, in the other commanding something to be done; for instance, it may either forbid the creation of a threatened nuisance, or enjoin its removal if established. It is borrowed from the Roman law, which, under the name of "interdict," had a very wide application. A court of chancery, having assumed jurisdiction of a case, will, if necessary, enjoin the defendant from taking the same action before a

court of law. But for the exercise of this power on the part of a chancellor, conflicts of jurisdiction, detrimental to the public welfare and vexatious to private citizens, might often arise. It is a rule of chancery courts, however, not to grant injunctions where litigants have an available remedy in courts of law. An injunction is either temporary or perpetual. A temporary injunction is issued upon *ex parte* evidence, and is designed to bring both parties into court for an impartial hearing. If it appear that there was no just warrant for the injunction, it will be dissolved; if it be found to rest upon equitable grounds, it will be made perpetual. Injunctions are often employed to prevent infringements of patents, copyrights, and trade-marks, and in some special cases to restrain breaches of covenants and agreements. If a judgment for debt have been obtained, and the defendants afterwards discover the plaintiff's receipt for the sum laid in the declaration, the latter may be prevented by injunction from levying upon the goods of the former to satisfy such judgment. Where the party enjoined disregards the injunction he will be punished for contempt by the court upon application by the plaintiff.

INK (ante). Ancient Inks.—The inks of the ancients had nothing in common with ours except the color and the gum employed for obviating too great fluidity. Employing broader-pointed pens than ours they required thicker inks, and though the composition of these inks is not fully understood, yet it is certain that they excelled ours in both richness and stability of color. Ample testimony to these characteristics is borne by existing papyri, whose age is more than 4,000 years, and by the brown leather and white vellum MSS., of an age exceeding 3,000 years, which are now treasured in the museums of Europe. While some of these inks were pigments, like the India and Chinese inks of to-day, others seem to have been actual dyes of iron and acids, with the addition of a good deal of ivory-black, lampblack, soot, or other form of carbon. From Persius and Ausonius, we learn that the Romans made use of the juice of the cuttle-fish, or sepia, which abounded in the Mediterranean. Most elegant manuscripts written in golden and silver inks have come down to our day; and also a few written wholly in red ink, made of vermilion, purple, or cinnabar, though red was more frequently used for headings of books, chapters, and pages. The emperors of Constantinople were wont to sign the acts of their sovereignty with red ink, and their first secretary was guardian of the vase containing the cinnabar or vermilion, which only the emperor might use. Green ink, though rarely found in charters, often occurs in Latin manuscripts, especially those of later years. It was also used by the guardians of the Greek emperors, before their wards obtained their majority. Blue or yellow inks, fortunately, were seldom employed in manuscripts; and in his *Origin and Progress of Writing*, Thomas Astle said that he had neither found nor heard of the use of yellow ink during the past 600 years.

INKBERRY, *Ilex glabra*, a shrub belonging to the holly family (*aquifoliacea*). Leaves evergreen, an inch or more long, wedge-lanceolate or oblong, sparingly toothed toward the apex, of a beautiful dark green color, smooth and shining on the upper surface. peduncles, half an inch or more in length, the sterile ones being from 3 to 6 flowered, the fertile ones solitary and producing small black berries. The shrub is from 3 to 4 ft. high and grows upon sandy soils along the coast of the United States from Cape Cod to Florida. The leaves and bark have been used as a remedy in intermittent fever, but do not possess much power. Its principal use is for decoration, as a constituent in bouquets. It is brought to New York and Philadelphia in quantities from southern New Jersey.

INMAN, HENRY, 1801-46; b. N. Y.; an eminent painter. With a preference for the military profession he intended to enter the academy at West Point, but on seeing at Jarvis's studio Wertmüller's picture of Danae his purpose was changed; he became a pupil of Jarvis, and early excelled in miniature painting. He afterwards devoted himself to portraits, and also to landscape, genre, and history. He spent some time in Boston and Philadelphia. His health failing, he visited England in 1844, where he painted portraits of Chalmers, Wordsworth, and Macaulay. On his return he began for the national capitol a series of historical pictures, one of which was "Daniel Boone of Kentucky," but which was unfinished at his death. Among his best works were the portraits of chief-justice Marshall and bishop White, his "Rip Van Winkle awaking from his Dream," "Mumble the Peg," and "Boyhood of Washington." He was made vice-president of the national academy of design. He had a fine literary taste, and wrote several valuable sketches.

INMAN, JOHN O'BRIEN, son of Henry, an artist. From the west, where he had gained a reputation as a portrait painter, he came to New York and opened a studio. His flower-pieces and genre pictures have been much admired, and found a ready sale. He went to Italy in 1866.

INN—INNKEEPER (ante). The meaning attached to these terms in this country is almost if not quite identical with that which they bear in England. The duties and responsibilities of innkeepers to their guests are also the same in principle in both countries. The only difference is that in many of the American states an innkeeper who provides a safe for the use of his guests, and notifies them that they should place therein their "moneys, jewels, and ornaments," is not responsible for the loss of such articles

if the guest neglect to avail himself of this means of safety. The man who merely takes his meals in a public restaurant attached to an inn is not a guest of the inn itself; his rights are merely those of a casual boarder. An innkeeper may entertain boarders as well as travelers, but his responsibility for the safety of the goods of the former is not the same as that which he assumes in the case of the latter. He is responsible not merely for the traveler's personal baggage, but for all the goods received into his custody; and if they are lost or destroyed by any agency except "an act of God"—by which is meant lightning, storm, earthquake, or anything outside of the ordinary course of events—he must pay for them. Of course if the traveler lose his goods by his own carelessness or that of his servant, the innkeeper is not responsible.

INNESS, GEORGE, b. N. Y., 1825; a landscape painter. He came to New York at the age of 16 to study engraving, but on account of ill health returned to his parents, then living in Newark, N. J. The next four years he spent at home, painting and sketching; and again coming to New York, he passed a month in Gignoux's studio. He visited Europe twice, spending some time in Italy. After his return he lived in Boston. In 1862 he went to Eagleswood, N. J., where for a time he practiced his art. His work is in the style of Rousseau. Many of his landscapes are greatly admired. Among his best pieces are "The Sign of Promise," "Peace and Plenty," "A Vision of Faith," "Going Out of the Woods," "Passing Storm," "Summer Afternoon," "Twilight," "Sunshine and Shadow," "The Apocalyptic Vision of the New Jerusalem and River of Life," and "Light Triumphant." He now lives in Boston.

INNUIT. See ESQUIMAUX, *ante*.

INO, in Grecian mythology, was the daughter of Cadmus and Harmonia. Athamas king of Thebes, having divorced Nephele, whom he had married by the command of Juno, then married Ino, who bore him two sons, Learchus and Melicertes. Ino, jealous of Phrixus and Helle, the sons of Nephele, as her sons' rivals to the throne, sought to destroy them. This so enraged Juno that she made Athamas mad, who in his frenzy killed his son Learchus. Ino, fleeing with Melicertes in her arms, pursued by her husband, leaped into the sea, and was changed by the gods into a sea-goddess under the name of Leucothea. The story of Ino is used with many variations by Sophocles and other Greek dramatists.

INOSITE, or PHASEOMANNITE (Gr. *ινός*, muscle), $C_6H_{12}O_6$, a variety of glucose, or grape sugar, named from its occurrence in the muscular substance of the heart as first shown by Scherer. Cloetta found it in the lungs, kidneys, spleen and liver, and Müller in the brain. It is also contained in urine in *diabetes mellitus*, and in Bright's disease of the kidneys, and also in abundance in the vegetable kingdom, as in the unripe fruit of *Phaseolus vulgaris*, green kidney beans, peas, cabbage, asparagus, and many other plants. By careful crystallization, it is obtained in beautiful rhombic tables resembling gypsum. In microscopic preparations it has the form of fine prismatic tufts. It readily dissolves in water, but is insoluble in alcohol or ether. It does not ferment under the influence of yeast, but with cheese, flesh, and decaying animal tissues in the presence of chalk, it undergoes lactic fermentation—lactic, butyric, and carbonic acids being formed. Inosite is unchanged when heated with dilute mineral acids, and also when boiled in strong aqueous solutions of potash or baryta, without being colored. If inosite be evaporated nearly to dryness, and a small portion of calcium chloride and ammonia be added, upon re-evaporation a beautiful, characteristic rose color will be produced. See SUGAR.

INO'UYE KAYO'RU. A Japanese statesman b. in Choshiu. Sent to Europe by his daimio in 1863 to study, he returned in 1864 and endeavored, by acting as mediator to his clansmen, to prevent the bombardment of Shimonoseki in 1864. He was appointed minister of finance. He went to Corea, and negotiated the treaty with Corea, Feb. 27, 1876, after which he visited the centennial exposition at Philadelphia. He was appointed minister of foreign affairs, 1879. Under his conduct the treaties with Japan will be revised.

IN PERSONAM. See IN REM.

INQUEST OF OFFICE, a process to put the king or the state in possession of escheated lands or tenements, goods or chattels. The case must be tried by a jury, not of any particular number of persons; it may be twelve, or more or less than that number, as may happen to be convenient. In this country the process is resorted to when real property is to be forfeited to the state for want of heirs. In states where aliens, by the operation of the common law, are not allowed to hold real estate, an inquest of office would be applicable to vest in the state the title to lands in their possession.

INQUISITION (*ante*). The first Christian emperors, following the example of their predecessors in regarding themselves as legal masters of all things within the empire, assumed the control of theological opinion and the punishment of errors therein. Constantine banished Arius, after his condemnation by the council of Nicæa, and ordered his books to be burned. He afterwards banished Athanasius. Constantius, 335, inflicted the same punishment on Hosius of Cordova because he refused to condemn Athanasius. Theodosius, having resolved to exterminate Arianism, compelled the archbishop of Constantinople to resign, directed his lieutenant to expel by force of arms all

the Arian clergy from the churches, issued many edicts against all heretics, and was the first of the Christian emperors to inflict the penalty of death on a Christian because of heretical opinions. In the 8th c. synodal courts increased the facilities for detecting and punishing heresy.

The inquisition in FRANCE. In the latter part of the 12th c. various sects called heretical, such as the Cathari, Albigenses, and Waldenses, had increased so much, especially in the s. of France, that very vigorous measures to destroy them were deemed necessary. Papal legates, accordingly, were sent to assist in the work; and from that time the inquisition became a permanent institution. The work of seeking out and punishing heresy was systematically pursued. Two or three persons in each parish, and, if necessary, all the inhabitants, were made sworn agents in discovering those who were heretical, who held secret meetings, or forsook, in any particular, the prescribed course. They who refused to take the oath exposed themselves to the suspicion of heresy. Bishops who were not zealous in searching out the heretical were deprived of office; and, whether zealous or not, they were under the supervision of the legates, who in fact controlled the work. The commission, which the council of Toulouse required to be appointed in each parish, was to be employed exclusively in searching out heretics and in reporting them for trial and punishment. He who concealed the guilty forfeited his offices and lands. The house which sheltered them was to be destroyed. If they were sick, no physician was allowed to visit them. The penitent among them, clad in a peculiar garb, were driven from their homes, and, unless specially favored by the pope, were deprived of all office. But as, notwithstanding all these measures, heresy still prevailed, the inquisition was made a papal tribunal to which the bishops themselves were subjected and over which the monks of the Dominican order were appointed the permanent head. Their eagerness in the work soon gave popular currency to a satirical change of their name into *Dominici canes* (the dogs of the Lord). The civil authority was made the executioner of the judgments which they pronounced. Persons who were even suspected of heresy were liable to imprisonment, accomplices and criminals were received as witnesses, the accused never saw his accusers nor was told who they were. Torture for compelling confession was at first allowed to be used only under the authority of the civil power; but afterwards, in order to maintain secrecy, the inquisitors themselves applied it at their pleasure. The jurisdiction and also the emoluments of the tribunal were enlarged by extending the meaning of the word *heresy* so as to include usury, fortune telling, insult to the cross, contempt of the clergy, and connection with leprous persons, Jews, and demons, demonolatory, and witchcraft. Those who recanted were condemned to practice penance of the severest kind, and were often deprived of all their privileges, rights, and property. Those who barely escaped conviction were imprisoned for life; and the obstinate and the relapsed were put to death at the stake by the secular arm. In 1252 Innocent IV. commanded that accused persons should be tortured not only to make them confess their own heresy, but also to reveal that of others.

In GERMANY the first inquisitor was Conrad of Marburg, who administered the office with great severity (1231-33). The sentences of death which he pronounced were all approved by the emperor, Frederic II., but were so vigorously opposed by the nobility and people that very few of them could be executed. In 1233 the lower orders of people, taking the law into their own hands, attacked and killed Conrad in the streets of Strasburg. When the Beghards appeared, 1367, Urban V. appointed two Dominicans inquisitors, who, countenanced by the emperor, Charles IV., renewed in Germany the cruelties practiced by their order in France. Afterwards the number of inquisitors was increased to six for the n. of Germany alone. As the reformatory influences increased, the general work of the inquisition was diminished, but in the latter part of the 15th c. a special zeal against sorcery and witchcraft was awakened, under the transient power of which many persons were put to death. In the 16th c. the reformation overthrew the tribunal, and all subsequent efforts to set it up again in Germany proved vain.

In ITALY the inquisition, partially introduced under the Dominicans in 1224, was fully established by Gregory IX. in 1235. Its power was first directed chiefly against the Waldenses, who, having fled from the s. of France to Piedmont, were filling Italy with their doctrine. Afterwards it took in hand other heresies also; but it was greatly weakened by the schism in the papacy and by political agitations in the free states of Italy. About the middle of the 14th c. notwithstanding the opposition and the censures of Clement VI., measures were generally adopted to restrain its exorbitant power. The inquisitors were compelled to associate the bishops with them in examining accused persons; they were restricted to the cognizance of heresy alone, and the power of imprisonment, confiscation, fine, and corporal punishment was remanded to the secular arm. But such procedure having proved insufficient for suppressing free inquiry and maintaining the authority of the church, Paul III. instituted a supreme and universal inquisition at Rome, consisting of six cardinals, and having authority on both sides of the Alps to try all causes of heresy, with the power of arresting and imprisoning suspected persons and their abettors, of whatsoever estate, rank, or order. The grace of reconciliation and absolution the pope retained in his own hands. He assumed also the authority of the judge, and arrogated the power of life and death even over the subjects of the different governments of the world. These cardinal inquisitors soon made them-

selves feared in Italy and all countries over which they had influence. In Rome they executed their victims with less publicity but more frequency than the Spanish inquisitors. They were tyrannical also in their treatment of the press. Some books they destroyed, others they disfigured, and all printers they restrained from doing any work without a license from them. Opposition to them, however, everywhere arose. The republic of Venice, refusing to receive a tribunal responsible only to the pope, insisted that with his officers a certain number of Venetian magistrates and lawyers should always be joined, and that the final sentence concerning lay persons should be submitted to the senate before it was announced. The Neapolitans at the beginning of the 16th c. had twice resisted successfully the establishment of the inquisition among them. In 1546 the emperor, Charles V., renewed the attempt to introduce it into Naples, and according to the Spanish model. But the people, rising in arms against it, refused to receive anything more than a tribunal of limited powers similar to that of Venice. In Sicily, Spain supplied an inquisitor; and after the tribunal had been for a time abolished, it was restored in 1782, and was retained until 1808, when Napoleon, as king of Italy, abolished it. In Sardinia, having been restored by Gregory XVI. in 1833, it continued until the revolution of 1848. In Tuscany three commissioners, elected by the congregation at Rome, in concert with the local inquisitor, handed over their sentence to the duke, who was bound to execute it. In addition to this provision the "holy office" exerted its influence with the local authorities to send accused persons, especially ecclesiastics and strangers, to be tried at Rome. Since the abrogation of the pope's temporal power the tribunal still exists at Rome, but its public action is greatly restrained.

SPAIN. The inquisition was commenced, 1242, in Aragon, where the council of Tarragona gave instructions to the Dominicans. During the 13th and 14th centuries its power was directed fiercely against the Albigenes, who were numerous in that part of Spain. St. Ferdinand sometimes threw the fagots on the pile, and John II. hunted the heretics of Biscay as wild beasts among the mountains. By the middle of the 15th c., when the heresy of the Albigenes had been almost extirpated, new material for the inquisition was found among the Jews, many of whom, having professed conversion to Christianity, were suspected of being still unbelievers. After the union of Aragon and Castile the inquisition was reorganized in a more malignant form with the zealous approval of Ferdinand and the reluctant assent of Isabella. The first three general inquisitors, Torquemada, Deza, and Ximenes, made their names infamous by cruelties which, after all the deductions which can possibly be claimed, appear improbable and almost incredible, simply because of the multitude of the victims, and of the horrible sufferings to which they were doomed.

In PORTUGAL the efforts made to establish the inquisition failed almost entirely until after the union with Spain. It was then, under Spanish influence, introduced, yet not without difficulty, and only as a tribunal of the crown. The pope protested against this independent feature of it, but was compelled to tolerate what he could not prevent, and to be satisfied with a share in the proceedings and of the pecuniary gains. The highest tribunal was at Madrid, and the grand inquisitor was appointed by the king, subject nominally to approval by the pope. When Portugal became again an independent kingdom, John IV. endeavored to abolish the inquisition, but was prevented by the opposition of the Jesuits and priests. In the 18th c. Pedro II. succeeded in imposing restraints on the tribunal; in the next reign, the Jesuits having been expelled, its power was still further diminished; and under John VI. it was abolished, and the record of its proceedings burned.

Into the NETHERLANDS the inquisition was introduced in the 13th c., and exerted its authority severely. Under Spanish influence it was especially active during the reformation. In 1521 Charles V. published at Worms an edict against heretics, and appointed two inquisitors for the Netherlands, who, entering immediately on their work, were greatly aided by the regent, Margaret of Austria, and Granvella, bishop of Arras. Nevertheless, the reformation spread, and Charles, bent on destroying it, commanded the inquisition to be reorganized after the Spanish model. This command he afterwards modified in consequence of the courageous representations of the new regent, Maria, queen of Hungary. Still the tribunal was very active, and great numbers of persons were condemned and put to death. Under Philip II. new cruelties were inflicted which, instead of extinguishing heresy, added new intenseness to popular fury. Several cities immediately united in demanding the abolition of the tribunal; others joined them, and in 1556 a league of the nobility was formed which, in loyal but earnest terms, renewed the request. This was for a time granted; but soon the duke of Alba was sent to the Netherlands with unrestricted powers; and cruelties, hitherto unknown, were inflicted on the suspected and the rich. In 1568, by a sentence of the "holy office" all the inhabitants of the Netherlands were condemned to death as heretics. "From this universal doom only a few persons, specially named, were excepted. A proclamation of the king, dated ten days later, confirmed this decree and ordered its instant execution. Three millions of people—men, women, and children—were sentenced to the scaffold in three lines" (Motley, *Rise of the Dutch Republic*, ii. 155.). Even this did not destroy the reformation; but after the provinces had been desolated and almost depopulated by emigration and death, their independence was secured, and the inquisition driven from the land.

IN MEXICO, SOUTH AMERICA, and INDIA the inquisition was established by Portugal and Spain. Under John VII. of Portugal it was abolished in India and Brazil.

IN REM, a legal phrase designating an action against the thing, in contradistinction to proceedings *in personam*, or against the person. In admiralty practice such actions are common. They are brought for the enforcement of maritime liens against a vessel or cargo for the recovery of salvage, to procure the forfeiture of property, for a violation of the revenue laws, or to obtain possession of a prize in time of war. The action is solely against the property, taking no account of the owner or person in possession. The property, whatever it may be, is treated as if it were the defendant. If it be a vessel of that name, the title of the action will be "The United States *vs.* the ship *Parthian*." The same form of action is used to determine the legal status of a party before a court in respect to marriage, divorce, or other personal relations. Decrees in actions *in rem*, in whatever country they may have been made by a court of competent jurisdiction, are generally respected by the courts of other countries.

INSANITY (*ante*), unsoundness of mind. Unhealthiness and unsoundness, according to general usage, are not synonymous terms when applied to the mind. A perfectly healthy mind requires a perfectly healthy body, and it also needs a certain healthy or normal training. The degree and also the quality of unhealthiness or unsoundness to constitute insanity must be such as to destroy a certain amount of the self control of the individual, or to produce a degree of *perversion* of the intellectual or moral faculties. Modern alienists hold that such perversion is always connected with physical disease of some part of the nervous system. In most cases post-mortem examinations, as they are now made, reveal nervous lesions of some kind in all persons dying insane. Certain rules, useful, though sometimes empirical, for the diagnosis of insanity are adopted by physicians. Persons threatened with insanity are usually depressed in their manner, or are easily excited, the excitement being greatly out of proportion to the cause. A want of co-ordination of the faculties of the mind leads the subject to erroneous conclusions, and the formation, therefore, of false data; hallucinations appear, and the mind becomes completely unhinged. All forms of insanity have one important symptom in common, which is an impairment of the faculty of attention, arising, probably, from the loss of will. Delusions and hallucinations are, however, more certain symptoms, and clear ideas as to the definition of these terms are important. A delusion is more nearly connected with the mind; a hallucination is the result of an error in some sensory function. A man laboring under a delusion may believe that he is about to lose, or has lost, all his property when there is no foundation for such a belief, or that he is some other person, or that he is in possession of great riches. These delusions, therefore, may be of a gloomy or of a hopeful and exalted nature. A person laboring under a hallucination may imagine that he sees a spirit, or a person who does not exist, or different kinds of animals. In the temporary insanity of delirium tremens such hallucinations often occur. Hallucinations affecting the organs of taste and smell are common among the insane, and they are usually of an unpleasant character. Hallucinations of sight are common in those stages of insanity accompanied by exhaustion of the brain, when supernatural visions are likely to occur, and such patients often imagine that they hear voices commanding them to perform certain acts, often of a criminal nature, and of course they are then dangerous. Insane persons have a disposition to take off their clothes, sometimes probably from a feeling of oppression, sometimes with the idea of exposing the person. Insanity, especially that connected with epilepsy, often manifests itself in homicidal tendencies and acts. Although the qualities of insanity are infinitely various, as must be the result from the infinitely various parts of the nervous system which may be the cause of the aberrant phenomena, or the infinitely various ways in which those parts may be affected, still it is found convenient to classify the various forms into certain general groups, and the practice is not entirely empirical, but is connected with sound philosophy. The division of the older writers was mainly into mania, or violent insanity, and melancholy, with many subdivisions. There were then many fanciful distinctions because the researches of histological pathology had not connected physical phenomena with these causes. It was believed that physical disease was the chief cause, but what the nature of the ailment might be was not as well understood as now. Thomas Arnold, in 1802, made a classification into ideal, and notional, including over thirty varieties. Among certain sub-varieties, which he called pathetic, of which there were sixteen, were amorous, jealous, avaricious, misanthropic, suspicious, bashful, timid, sorrowful, etc. Pinel (q.v.), one of the original reformers in the treatment of the insane, made four principal divisions—mania, melancholy, dementia, and idiocy. Esquirol added monomania. Dr. Pritchard, in 1835, discriminated between moral and intellectual insanity, but many authorities do not recognize such a disease as moral insanity. That insanity is hereditary is now admitted by all alienists and physicians; also, that the inheritance is one of a physical nature, stamped deeply upon the typical structures of the organs of the body. Drunkenness is considered as one of the most powerful causes of insanity, and statistics support the opinion. The report of the commissioners of lunacy in England, in 1844, attribute 18 per cent of about 10,000 cases to the effect of alcohol. Dr. Benjamin Rush attributed the drinking of alcoholic liquors as the cause of more than one-third of the cases in America. Dr.

W. B. Carpenter, of London, in his work on *Mental Physiology*, says that this indulgence weakens the *will* to that extent that control is lost over the emotions. Weakening of the will is, indeed, one of the important features of insanity, and the powerful influence of the extreme use of opium and tobacco in this relation, as well as in weakening the memory, has been the personal experience of many. Dr. Maudsley believes that one of the most powerful causes of insanity is the eager pursuit of riches. He says: "In several instances in which the father has toiled upwards from poverty to vast wealth, with the aim and hope of founding a family, I have witnessed the results in a degeneracy, mental and physical, of his offspring, which has sometimes gone as far as extinction of the family in the third or fourth generation. When the evil is not so extreme as madness or ruinous vice, a mother's influence having been present, it may still be manifest in an instinctive cunning and duplicity, and an extreme selfishness of nature. I cannot but think, after what I have seen, that the extreme passion for getting rich, absorbing the whole energies of a life, does predispose to mental degeneration in the offspring—either to moral defect or to moral and intellectual deficiency, or to outbreaks of positive insanity under the conditions of life."

Institutions for the Insane.—The history of the care of the insane is full of interest. Among the ancients mental disease was less frequent than in modern times, but there were cases of insanity, and these were looked upon with a degree of awe, and the disease was often held to be sacred. In modern times, until the present century, less regard has been paid to the humane treatment of the insane than in any other period of history; although, during the dark and middle ages, the ignorance upon the subject, and the unsettled state of public affairs, must have led to great neglect or cruelty. But neglect to the unfortunate lunatic was much preferable to the care he received when imprisoned within the walls of a madhouse, and subject to the will of a keeper, who was often chosen more on account of his physical than his moral or intellectual qualities. In Europe one of the first measures in the reform of institutions for the insane was made by Pinel, who, in 1792, liberated fifty-three patients at the Bicêtre from chains in which they were bound. But he had been preceded in the same direction by Dr. Franklin, with others, as early as 1750, in the organization of the Pennsylvania hospital, in which a department for the care of the insane was established. A system of treatment was there adopted which was afterwards practiced by Pinel. In England, during the 16th, 17th, and part of the 18th centuries, considerable attention appears to have been given to insane asylums, and lunatics often received comparatively kind treatment; but for various causes, which seem ever to be the accompaniments of human institutions, the management became bad, and the society of Friends, in 1792, established an institution called the "Retreat," which was so successful that the attention of the government was finally called to the subject. A commission was appointed by the house of commons, whose investigations revealed a horrible state of affairs. It was brought out in the evidence before them that it was customary, when lunatics were taken to Dublin, to tie them to the back of a cart and force them to walk the whole distance. About one in five lost an arm from this treatment. It was found, in one house where there were 23 confined—14 men and 9 women—and where 7 of the women were supported at their own expense, that one room on the ground floor, 21 by 16 ft., and 7 ft. high, contained only six cells, 9 ft. long and 5 ft. wide, with a passage of 3 ft. between. There were no windows, and no means for ventilation; and the door opened opposite a pigsty and dung heap about 7 ft. distant. Three cells had board floors, the other three were on the bare ground. The bedsteads consisted of wooden boxes, 6 ft. long and 2½ wide, to which the patient was chained. These unfortunates were taken into the open air once a week, when the straw was changed. The patients were so dirty that careful inspection was impossible. In regard to treatment, the physician at Bethlem said: "Twice a year, with a few exceptions, the patients are bled, and after that they take vomits once a week for a number of weeks, and after that we purge them." That has been the practice for years, long before my time."

The different forms of insanity are usually considered under the following divisions: 1. Melancholia; 2. Mania; 3. Dementia; 4. Imbecility; 5. Idiocy; 6. General Paralysis. Melancholy is usually preceded by hypochondria, and this is caused or accompanied with certain diseased conditions of the bodily organs, very frequently of the liver and digestive organs. The condition is often relieved by frequent administration of cathartics, combined with good diet, wine, iron, exercise, and recreation. When these remedies fail the patient will generally pass into a condition of mania. This is the case when the brain is the subject of degeneration through disease. This deprives the patient of the power of exercising the will; delusions and hallucinations supervene, and the condition becomes one of decided mania. Restraint often becomes necessary, but the tendency is to its abolishment as much as possible, it being rarely practiced except in the acute stages. Mania may be acute or chronic. When there is hereditary taint it may be caused by grief or disappointment; but peculiar forms accompany epilepsy and general paralysis of the insane. The subject of mania exhibits the presence of the disease generally by great mischievousness or filthiness or obscenity, or by all of them. The bodily health of a maniac often does not seem to suffer, but frequently there is great constipation, and serious disturbances are taking place in the cerebral substance, as post-mortem examinations often reveal; but often they are not of a nature to cause

NAME OF INSTITUTION.	Locality.	Kind.	1873.	1875.	Date and Pat's.	Organ.
Butler Hospital.	Providence, R. I.	Corp.	129	143	1879, 148	1845
General Hospital for Insane.	Middletown, Conn.	State	395	450	1879, 510	1866
Retreat for the Insane.	Hartford, Conn.	Corp.	148	130	1878, 123	1824
Spring Hill Institution.	Litchfield, Conn.	Priv.		20		
Crownwell Hall.	Cromwell, Conn.	Priv.			1880, 12	1877
State Emigrant Insane Asylum.	Ward's Island, N. Y.	State	187	148		
Hudson River State Hospital.	Poughkeepsie, N. Y.	State	185	200	1878, 232	1873
N. Y. State Lunatic Asylum.	Utica, N. Y.	State	580	635	1877, 582	1843
State Lunatic Asylum for Insane Criminals.	Auburn, N. Y.	State	86	106	1877, 104	
Willard Asylum for Insane.	Willard, N. Y.	State	770	1175	1879, 1502	1869
State Homeop. Asylum for Insane.	Middletown, N. Y.	State	27	80	1878, 146	1874
City Asylum for Insane.	Ward's Island, N. Y.	City	559	700	1878, 980	1861
Kings County Lunatic Asylum.	Flatbush, N. Y.	Co.	718	778		1855
City Lunatic Asylum.	Blackwell's Isl'd, N. Y.	City	1077	1276	1878, 1234	
Monroe County Asylum.	Rochester, N. Y.	Co.		158		
Bloomington Asylum.	Manhattanville, N. Y.	Corp.	189	189	1878, 188	1821
Providence Asylum.	Buffalo, N. Y.	Corp.		75		
Sanford Hall.	Flushing, N. Y.	Priv.	27	31		1845
Private Asylum.	Pleasantville, N. Y.	Priv.		6	1880, 7	
Brigham Hall.	Canandaigua, N. Y.	Priv.	72	70	1879, 59	1855
Marshall Infirmary.	Troy, N. Y.		91		1878, 110	1859
Asylum for Chronic Insane.	Binghamton, N. Y.	State				1880
State Lunatic Asylum.	Trenton, N. J.	State	653	714	1879, 506	1847
Essex County Lunatic Asylum.	Newark, N. J.	Co.		150		
New Jersey State Lunatic Asylum.	Morristown, N. J.	State		342	1879, 527	1876
Penn. State Lunatic Asylum.	Harrisburg, Penn.	State	408	416	1879, 426	1851
Western Penn. Hospital for Insane.	Dixmont, Penn.	State	450	491	1879, 609	1857
State Hospital for the Insane.	Danville, Penn.	State	166	260	1878, 360	1872
Department for Insane, Alms-house.	Philadelphia, Penn.	City	1023	1027		
Penn. Hospital for the Insane.	Philadelphia, Penn.	Corp.	416	419	1878, 406	1841
Friends' Asylum for the Insane.	Frankford, Phil., Penn.	Corp.	78	89	1878, 82	1817
Burn Brae.	Kelley	Priv.			1880, 36	1880
State Hospital for the Insane.	Warren, Penn.	State			Capacity 750	1880
	Norristown, Penn.	State			1880, 611	1880
Maryland Hospital.	Croftsville, Md.	State	127	155	1879, 329	1872
Mount Hope Retreat.	Baltimore, Md.	Corp.	252	297	1879, 370	1842
Government Hospital for the Insane.	Washington, D. C.	Nat'l	620	718	1879, 819	1855
Eastern Lunatic Asylum.	Williamsburg, Va.	State	268	294	1879, 323	1773
Western " " " "	Staunton, Va.	State	334	356	1879, 448	1828
Central Lunatic Hospital (colored).	Richmond, Va.	State	194	243	1879, 223	1870
Hospital for the Insane.	Weston, W. Va.	State	284	350	1878, 415	1864
Insane Asylum for North Carolina.	Raleigh, N. C.	State	242	250	1879, 277	1856
Asylum for the Insane.	Columbia, S. C.	State	309	300	1879, 375	1827
Lunatic Asylum.	Milledgeville, Ga.	State	564	516	1879, 754	1841
Hospital for the Insane.	Tuscaloosa, Ala.	State	330	352	1878, 403	1860
Lunatic Asylum.	Jackson, Miss.	State	304	325	1878, 401	1855
	Jackson, La.	State	165	167	1879, 210	
Hospital for the Insane.	Austin, Tex.	State	115	152	1878, 275	1861
	Nashville, Tenn.	State	372	375	1878, 376	1848
Eastern Kentucky Lunatic Asylum.	Lexington, Ky.	State	528	526	1879, 549	1824
Western " " " "	Hopkinsville, Ky.	State	322	340	1879, 376	1854
Central " " " "	Anchorage, Ky.	State	155	270	1878, 241	1873
Cleveland Hospital for Insane.	Newburg, O.	State	250	560	1880, 625	1855
Western " " " "	Dayton, O.	State	560	600	1879, 599	1855
South-eastern " " " "	Athens, O.	State		605	1879, 571	1874
North-western " " " "	Toledo, O.	State		111	1879, 115	
Central Ohio Asylum.	Columbus, O.	State			1879, 830	1877
Longview Asylum.	Carthage, O.	City	1872	600	1879, 683	1860
Cincinnati Sanitarium.	College Hill, O.	Priv.	577	50	1879, 44	
Asylum for the Insane.	Kalamazoo, Mich.	State	1872	550	1878, 497	1859
Eastern Mich. Asylum for Insane.	Pontiac, Mich.	State	305		1878, 306	1878
Hospital for the Insane.	Indianapolis, Ind.	State	474	500	1876, 600	1818
Central Hospital for the Insane.	Jacksonville, Ill.	State	472	450	1878, 534	1848
Southern " " " "	Anna, Ill.	State		200	1878, 458	1871
Northern " " " "	Elgin, Ill.	State	172	200	1878, 525	1871
Cook County Asylum.	Chicago, Ill.	Co.		300		
Bellevue Place.	Batavia, Ill.	Priv.	30	20		1867
Oak Lawn.	Jacksonville, Ill.	Priv.		12		
Hospital for the Insane.	Mendota, Wis.	State	314	375	1879, 507	1860
Northern Hospital for the Insane.	Oshkosh, Wis.	State	205	550	1879, 546	1862
Hospital for the Insane.	Mount Pleasant, Iowa.	State	495	550	1877, 608	1861
" " " "	Independence, Iowa.	State	113	251	1879, 450	1872
" " " "	St. Peter, Minn.	State	223	517	1878, 665	1866
Lunatic Asylum No. 1.	Fulton, Mo.	State	1870	350	1878, 410	1851
" 2.	St. Joseph, Mo.	State		250	1878, 216	
St. Louis County Asylum.	St. Louis, Mo.	Co.	299	320	1879, 322	1863
St. Vincent's Asylum.	St. Louis, Mo.	Corp.	213	157		
Lunatic Asylum.	Ossawatimie, Kan.	State	1872	111	1878, 267	1866
Hospital for the Insane.	Lincoln, Neb.	State	53	80	1878, 120	1871
Asylum for the Insane.	Stockton, Cal.	State	1156	1302	1878, 1127	1853
	Napa, Cal.	State		189	1878, 714	1875
Lunatic Asylum.	Portland, Oregon.	State	167	200	1878, 235	
	Steilacoom, Wash. T.	State	36	100	1879, 75	1872

INSANITY BEFORE THE LAW. See LUNACY.

INSECT FERTILIZATION. See FECUNDATION.

INSECTIVOROUS BIRDS. Recent investigations, especially in the western states and territories, have brought more fully into notice the valuable qualities of certain birds, as to their power of decreasing the multiplication of destructive insects. Although ornithologists have long given their advice and warnings, it has been the mistake of a considerable portion of the agricultural population of the country to believe that certain birds, which are called graminivorous, committed sufficient depredations to make them obnoxious, and therefore they have destroyed them. These fears may be well founded in a few instances, in regard to those predatory birds which destroy other and valuable birds, as the crow, the crow-blackbird, and the blue jay. Unfortunately these cunning birds are not the ones which have come in for the greatest share of condemnation. The blue-headed grackle, or Brewer's blackbird, a perfectly innocent little creature, and a friend of man, has been destroyed in the western country in countless numbers because it visited the cornfields in search of a kind of grub which lived upon the ears of corn. To get the grub the bird picked open the husks at the end of the ear, or through them at the sides. This did little damage to the ear, which the grub would have destroyed. But the farmer, fearful that the birds were carrying off his crop, soaked grain in strychnine, and strewing it upon the ground, caused the birds to die by the million. Prof. Samuel Aughey, of Lincoln, Neb., has furnished a list of locust-feeding birds for the first annual report of the U. S. entomological commission, which is extremely interesting and instructive, and from his chapter the notice of Brewer's blackbird above given is taken. It seems that this bird is purely insectivorous and does not live upon grain or seeds at all, unless it cannot get insects, grubs, or worms. Prof. Aughey states that the robin is not abundant in Nebraska, but is slowly increasing. A few were killed to ascertain the contents of their stomachs. Out of six, four of them had 51 to 59 locusts in their crops, and less than half that number of other insects. This was in the years 1865, 1875, and 1877, not great locust years, as 1874. A number of wood thrushes were bought from boys and their stomachs found filled with locusts (1865-75). The family of wrens were found particularly the friends of the farmer in their locust devouring habits. He mentions eight species, the long-billed marsh wren being perhaps the greatest feeder. The parents in one nest were seen to bring 31 locusts from dry bluffs about a mile distant in the space of an hour. The short-billed marsh wren was not detected in locust-carrying, but is believed to be a locust feeder. The house wren feeds upon quantities of small locusts, but was never seen to capture a full grown insect. The family *syrticolida*, or American warblers, of the same order (*insectores*), of which prof. Aughey mentions some 30 different species belonging to different genera, are nearly all great locust eaters. The golden warbler was a curious exception, as its stomach contained only half as many locusts as of other insects, while the converse was the rule with other species. The swallows and sparrows were found to be great locust eaters. The cliff-swallow, or cave-swallow, is perhaps the principal insect destroyer, on account of its numbers. It breeds on the sides of cliffs and under the eaves of buildings. U. S. geologist Hayden has observed great numbers of these birds along the Missouri river, especially along the chalk bluffs near Niobrara, and prof. Aughey also observed them in the same locality in 1877. Three miles e. of the town on the sides of a perpendicular chalk rock he counted 2,100 nests of the cliff-swallow. They eat countless numbers of locusts. Of the family *ampelide*, or *bombycillide*, or wax-wing family, the "brotherly love" vireo, a common bird in eastern Nebraska, eats vast numbers of locusts and other insects, and the warbling vireo, abundant in n.w. Nebraska, is quite as great a locust and other insect feeder. The shrike family (*lanide*), particularly the white-rumped shrike, which are quite abundant in Nebraska, are great locust eaters, but in their stomachs were also found portions of other insectivorous birds. They are, therefore, not to be highly commended. Among the American starlings, the bobolink, reed-bird, or rice-bird, is very abundant in Nebraska, where it breeds. It is popularly supposed to be exclusively graminivorous, but prof. Aughey discovered that on occasions it was highly insectivorous, as their stomachs, whenever examined, were found to contain, along with seeds, many locusts. The king bird, or bee martin, as well as many other "flycatchers," of which 10 or more species are mentioned, are, of course, highly insectivorous, but where locusts abound these insects are their favorite food, the phoebe bird particularly being a locust-gormand. The cuckoos, which are shot and sold by the butchers, were often found to have over 45 locusts in their stomachs, none less than 37. The golden-winged woodpecker, or flicker, was often found with no seeds in its stomach. Eight flickers were bought from a sportsman who had shot them in a wood in Dixon county, and their stomachs were filled with locusts and other insects. Two of them had eight grains, four of them from two to six grains, and two of them had none, in their stomachs. This beautiful bird, the robin, and even the merry bobolink, are hunted and shot, even in our eastern states, where they are not near plentiful enough, by unthinking men, and they ought to be protected. Mr. Cyrus Thomas, one of the members of the entomological commission for examining into the subject of the Rocky mountain locust, in chap. xii. of the report above mentioned, on "the usefulness of birds," maintains that, with very few exceptions, the whole class of

birds are the friends of man. We know that many of them are his companions, and certainly more would be if he did not lay his destructive hands upon them. See **BIRDS** and **ORNITHOLOGY**.

INSOLVENCY (*ante*). The distinction between insolvency and bankruptcy, so long observed in England, is unknown in the United States, where the two words are used interchangeably in legal proceedings as well as in ordinary speech. The constitution empowers congress to "establish uniform laws on the subject of bankruptcies throughout the United States." The laws of congress made in accordance with this provision have been called bankrupt laws, while those made by the states for the same purpose have generally been called insolvent laws; but this implies no essential difference in the meaning of the words. Whenever congress passes a bankrupt law, the insolvency laws of the states are thereby superseded. The first U. S. bankrupt law was enacted April 4, 1800, and repealed Dec. 19, 1803; the second, passed Aug. 19, 1841, was repealed in 1843; the third, enacted Mar. 2, 1867, was repealed May 11, 1878. These laws were alike in purpose and spirit, though differing in details. Their object was to discharge insolvent debtors upon the surrender in good faith of all their property, and to divide the same equitably among their creditors. They also provided a method whereby creditors, under certain conditions, could force a debtor into insolvency. The last law was repealed, not so much from any opposition to its main principle, as on account of the alleged needless expensiveness of some of its processes. As debtors and creditors are often citizens of different states, the operation of the state insolvent laws is often attended with much embarrassing and expensive litigation, which can be avoided only by confiding the whole matter to tribunals whose jurisdiction is not restricted by state lines. There are two different processes by which insolvent debtors in many if not all the states of the union frequently obtain their discharge, and these are sometimes preferred to a resort to proceedings in bankruptcy. One of these processes is what is known as a voluntary "composition" by the debtor with his creditors, whereby the latter agree to surrender a portion of their claims on condition that the remainder shall be paid. In such cases the parties usually enter into covenant, founded upon a sufficient consideration to make it valid, such covenant being in the form of a "composition deed" in which all the conditions of the bargain are set forth in legal form and under seal. This deed is made void by any subsequent fraud of the debtor in disposing of his property. The other method of relief is by assignment on the part of the debtor of all his property, to be equitably divided among his creditors. The assignee of the property assumes in law the responsibilities of a trustee, and is held to a faithful performance of his duty as the administrator of a trust fund. The mode of making such assignments is sometimes specifically regulated by statute. The fraudulent preference of any creditor by a debtor in contemplation of insolvency will, in general, be a sufficient ground for withholding a discharge. In many states the payment of a prior debt within a year of the insolvency proceedings, by a debtor having reason at the time to suppose himself insolvent, will prevent his discharge. Insolvency is either voluntary or involuntary. In the case of the former the debtor himself petitions to be allowed to take the benefit of the insolvency laws and to have a distribution of his property made among his creditors for the payment of his debts; and his petition sets forth the amount of his debts and his inability to pay them. In the case of involuntary insolvency, the creditor's petition that the assets of the debtor may be distributed under the insolvency laws among his creditors, on the ground of fraudulent concealment or conveyance of the debtor's property, or of his failure to dissolve within a certain time an attachment placed upon it. Upon proof of the facts alleged in the petition, a warrant against the debtor's property issues from the proper authority, judge of probate, master in chancery, or commissioner of insolvency, as the case may be. The officer of the court, or magistrate, thereupon takes possession of the debtor's effects. A meeting of the creditors is then called, and an assignee is chosen to whom the debtor's property is conveyed. He has absolute power over the property, subject to the order of the court, collects debts, makes payments, transfers real estate, calls meetings of the creditors, etc. In most states, after all the property of the debtor has been applied in payment of his debts, he is entitled to a discharge upon consent of a certain percentage of his creditors, according to number or to the amount of their claims.

INSOMNIA. See **SLEEP**, *ante*.

INSPIRED, THE, or COMMUNITY OF TRUE INSPIRATION, a small body of Christians who profess to derive their origin from pietists of Germany and from French Protestants of the Cevennes—a remnant of the Albigenses—named Camisards from the peculiar dress they wore. They receive the teachings of the German mystics, Böhme and Schwenkfeld, and cherish evangelical opinions, but do not use the sacraments. They claim at times to be divinely inspired, retaining their mental activity, but becoming insensible to outward things. They hold their property to some extent in common. In 1844 they established a community at Ebenezer, Erie co., N. Y., which continued 10 years. They then removed to Iowa, and have now settlements in that state and in Canada.

INSURANCE (*ante*). *Fire Insurance*.—The processes in vogue in the United States are practically the same as in England, whence they are derived. In insurance

against loss by fire the governing principles are simple, and, except in cases termed "hazardous" and "extra-hazardous," are generally understood. As to these latter the provisions are purely arbitrary and as stipulated between the contracting parties, being based on the great variety of the influences which affect the character and extent of the risk. However, the degree of liability of insurers is to be liberally construed as regards the insured; and the accidental presence among insured property of articles rated hazardous or extra-hazardous, is not to be considered as vitiating a policy otherwise valid. And, on the same principle, the definition of "storing" certain classes of goods, is not contemplated as depriving the insured party of the right to shelter such goods for his own domestic use without additional premium. So, also, a description in a policy of a building insured is not to be deemed violated to the extent of affecting the insurance, on account of any relative alteration of location by reason of the acts of outside parties, as in the case of the erection of new buildings changing the condition described as isolation. Injury, or even destruction, without ignition, does not involve liability on the part of the insurer. It is the same with regard to the effect of lightning: there is no liability unless positive fire ensues. Explosion from gunpowder is rated as a loss, while that from steam is not. Even negligence on the part of the insured does not lessen the liability of the insurer, except where this affords suspicion of fraudulent design. And, also, a fire which results from insanity in the insured party is not accounted any defense of the insurer. Stipulations permitting the insurer to rebuild or repair, at his own option, are frequent incidents in the framing of policies. The general understanding of the law of insurance provides that, in the event of false representations on the part of the insured inducing the acceptance of a risk on terms which would not have been granted by the insurer on a truthful statement, the policy is vitiated. Such representations, or the conditions governing them, are termed material to the risk, and only such. The same rule applies also to concealment on the part of the insured: concealment through ignorance, or of facts not material to the risk, is not considered to impugn the validity of the policy.

The number of New York fire-insurance companies in 1879 was 59; the number doing a fire-marine business, 22; total, 81. The number of fire companies of other states reported in the same year was 42; of fire-marine, 21; total, 63. Of New York mutual fire-insurance companies there were 6; of mutual fire-insurance companies of other states, 1; of foreign fire-insurance companies, 20; of foreign fire-marine, 2. Grand total of American fire-insurance companies doing business in New York, 108; of foreign, 20; of American fire-marine companies, 43; of foreign, 2. Final total of fire and fire-marine insurance companies doing business in New York, 173. It is shown by the annual report of the superintendent of the insurance department of the state of New York, for the year ending Dec. 31, 1879, that the number of fire and fire-marine companies doing business in the state was 173; that their combined capital amounted to \$50,992,220; their gross assets were \$120,221,458.33; liabilities, \$33,899,357.21. The income of these companies for the year was \$45,951,247.66; expenditures, \$45,894,816.95; net receipts over expenditures, \$56,430.71. The standing risks of the companies included averaged \$100 of insurance to \$2.15 of net assets; the average premium being 87 cents on every \$100 insured. Of the 173 companies considered, only 23 have had an existence dating back further than 1850, the three oldest being the Knickerbocker (1787), the Eagle (1806), and the Albany (1811). Of the remainder, 106 have been organized since 1860, 73 since 1870, and 52 between 1850 and 1860.—The great fire in Chicago, Oct. 8-10, 1871, causing a pecuniary loss of more than \$200,000,000, involved losses to the insurance companies amounting to \$96,533,721, all of which but \$6,000,000 was in United States companies. Of the companies involved, 57 were compelled to suspend. The loss by insurance companies after the great fire in Boston, Nov. 9, 1872, amounted to \$52,676,000, of which \$35,351,600 was borne by Massachusetts companies.

Marine Insurance includes in the category of losses covered by a policy those which may be occasioned by fire, barratry, piracy, theft, capture, arrest or detention—besides those caused by the action of the winds or waves, by sinking or grounding. An important principle obtains, permitting the insured to abandon the property in question, and declare a total loss, leaving the underwriter to make all that he can out of what remains in a damaged or otherwise unavailable condition. This abandonment, however, is allowed only when the partial loss exceeds 50 per cent of the value, and a provision of this character is usually inserted in the policy. In the United States there are two kinds of insurers—stock companies and mutual companies. In the first the profits are divided among the stockholders; in the second they accrue *pro rata* to the insured, or are applied to reduce the premiums paid. Marine insurance covers the ships, the cargo, the earnings for freight, and the profits upon the cargo. It is usual to place a valuation upon the ship, but the remaining losses become matters of proof. Illegality in the interest insured renders the contract void. Warranty is an important element in marine insurance, and is either express, which is made a part of the policy, or implied, as in the case of absolute seaworthiness at the time of insurance. Warranty covers the ownership, national character of the vessel, lawfulness of the cargo covered and the voyage, the taking of convoy, and the time of sailing. If the warranty be not justified the insurance does not attach. Implied warranty takes cognizance of misrepresentation, and also of concealment of material facts. It also requires that there

shall be no deviation from the course set down or implied, or from the stated destination. Such a change vitiates the insurance, and discharges the insurers from all subsequent risks. The illegality of a voyage or cargo discharges the insurer, not because of that fact, but because of its concealment, the law recognizing this as a risk not taken or implied in the contract. Insurance *from* a port begins on the actual departure of the vessel; insurance *at and from* a place begins when the destination named is reached by the vessel in good condition. A customary clause in insurance policies states that the insurance is in existence "until the ship be arrived and moored 24 hours in safety."—The number of New York marine insurance companies reported for 1879 was 7; other states, 1; foreign marine, U. S. branches, 8; total, 16, doing business in New York. The total assets of these companies was \$19,947,903.43; total income, \$8,042,498.50; total expenditures, \$6,024,005.99.

Life Insurance.—The germ of life insurance in the United States may be found in corporations chartered before the revolutionary war, one example of which was that organized in Philadelphia in 1769 for the benefit of the families of Episcopal clergymen, the rates and rules of which were suggested by Benjamin Franklin and his friend, Richard Price of London. In the early part of the present century the Massachusetts Hospital Life insurance company and the New York Life and Trust company were chartered, but their plans were crude, and they failed to attract much attention. It was not until 1843-46 that the foundations of the business were fairly laid. During that period companies were formed in New York, Massachusetts, New Jersey, and Connecticut, the success of which soon led to the organization of many others; the public attention was gradually awakened to the advantages of this form of insurance, new companies were chartered on every hand, and the business, small at first, increased with great rapidity. Its gigantic development is indeed one of the marvels of the century. Its progress has been far more rapid than in England, France, or Germany. At first the subject was very imperfectly understood, the popular enthusiasm outrunning the popular intelligence. "There is no business scheme known among men," says the Massachusetts insurance commissioner, "in which exist so many pitfalls for honest ignorance, or lurking-places for designing fraud, as in that of life insurance." Honest mistakes both as to principles and methods have in some instances been followed by disastrous results, while there is every reason to believe that in many instances covetous men have taken advantage of "the lurking-places for designing fraud." It is stated on high authority that of the 200 life insurance companies organized in this country, more than 120 have failed or retired—all but 20 of them since 1862. Forty-two failed outright, 72 reinsured their risks, and the remainder closed their doors under various mutual arrangements. No less than 55 companies, for one reason or another, ceased doing business in New York between 1859 and 1879. Many of those which became insolvent are now in the hands of receivers, where some of them have lingered for years, "affording rare opportunity," says the present Massachusetts commissioner, "for the robbery of policy-holders by a class of professional shysters." The numerous failures that have occurred and the disasters attending them have led to a more careful study of the subject, and many mistakes and abuses, the inevitable results of empiricism or carelessness, have been corrected. The legislation upon the subject has been greatly improved. The companies are now required to make a complete disclosure of their receipts, assets, expenditures, and investments, and of their methods of doing business, and when one is found to be drifting upon the rocks, the law interposes for the protection of its policy-holders.

Life insurance companies are of two general classes, proprietary and mutual. A proprietary company is constituted of those who furnish the capital necessary to the pursuit of the business. Insurers, as such, have no voice in the management, and no participation in the profits. In a mutual company, on the contrary, every policy-holder is an insurer as well as insured. The policy-holders exercise control through their power in the election of managers, and are entitled to their relative share of the profits. There are also companies in which the proprietary and the mutual principle are to some extent blended, those who furnish the capital required in the beginning, and who assume responsibility for the first expenses and early losses, covenanting to divide among the insured either the whole or a part of the profits.

The rates of insurance are determined by a table of mortality, compiled from the results of observation and experience, and showing the percentage of deaths likely to occur in a single year among a certain number of persons of a given age. The table, in other words, shows the average rate of mortality in the community. According to the "American experience table," so called, of 100,000 persons 10 years of age, living at a certain date, it is assumed that 749 will die during the ensuing year; and this death-rate determines the risk assumed by the company, and, in connection with other circumstances, the amount of the premium to be paid by the insured. From this point the calculation proceeds year by year, for 85 years, when it is assumed that of the whole 100,000 persons only 3 will be living. The table shows the death-rate in every year between the two extremes of 10 and 95. In fixing these rates of mortality no account is taken of health or disease, or of strong or weak constitutions. But as the companies are careful to insure only those who are certified by medical authority to be in sound health, the rate of mortality among the policy-holders must be far below that shown in

the table; a circumstance which, as any one may see, inures greatly to the advantage of the companies, whether fairly or not is a question for consideration. Certainly the rates of insurance are considerably higher than they would be if the calculation were made, not upon the general rate of mortality in the community as a whole, but upon that of a select number of persons certified by medical authority to be in exceptionally sound health. It is the usual practice of the proprietary companies to allow the policy-holders interest on the amount of their premiums at $4\frac{1}{2}$ per cent; the mutual companies generally allow 4 per cent. Of course the profits of the companies are largely drawn from the higher rate of interest at which they are able to invest the money received from their customers. In this respect their practice is the same as that of the savings banks, and few will doubt that it is legitimate and fair.

In the beginning there was no governmental supervision of the business of the companies, and they were allowed without restriction to confiscate to their own use the funds derived from policies that had lapsed, whether from accident or inability to meet an accruing payment. The periodical premium, by the conditions of the policy, was due on a certain day, and if it were not paid, the insurance was forfeited. The number of such cases was of course very great, especially in times of business depression, multitudes finding it impracticable to raise the money necessary to keep their policies alive. Within a few years the legislatures of some of the states—notably those of Massachusetts and New York—have interposed for the protection of policy-holders thus situated. The New York statute, passed May 21, 1879, declares that “whenever any policy of life insurance hereafter issued by any company organized or incorporated under the laws of this state, after being in force three full years, shall by its terms lapse or become forfeited for the non-payment of any premium, or of any note given for a premium, or loan made in cash on the policy as security, or if any interest on such note or loan, unless the provisions of this act are specially waived in the application, and notice of such waiver written or printed in red ink on the margin of the face of the policy when issued, the reserve on such policy, including dividend additions, calculated at the date of the failure to make any of the payments above described, according to the American experience table of mortality, and with interest at the rate of $4\frac{1}{2}$ per cent per annum, after deducting any indebtedness of the insured on account of any annual, semi-annual, or quarterly premium then due, and any loan made in cash on such policy, evidence of which is acknowledged by the insured in writing, shall, on demand made, with surrender of the policy within six months after such lapse, be taken as a single premium of life insurance at the published rates of the company at the time the policy was issued, and shall be applied, as shall have been agreed in the application and policy, either to continue the insurance of the policy in force at its full amount, so long as such single premium will purchase temporary insurance for that amount, at the age of the insured at the time of lapse, or to purchase upon the same life, at the same age, paid-up insurance payable at the same time, and under the same conditions, except as to payment of premiums, as the original policy.” It is also provided that “if the reserve upon any endowment policy, applied as a single premium of temporary insurance, be more than sufficient to continue the insurance to the end of the endowment term named in the policy, and if the insured survive that term, the excess shall be paid in cash at the end of such term, on the conditions on which the original policy was issued.”

Policies of life insurance are of various kinds, and they may be still farther varied by the addition of new or the suppression of old conditions, as the law permits. A whole-life policy is one in which the company binds itself to pay the representatives of the insured a certain amount of money at the end of the year in which he may die. The net premium for such a policy, the amount thereof being equitably fixed in view of all the elements entering into the case, may be paid wholly in advance or in annual or less frequent installments, as the parties may agree. A term-policy is one in which the company pledges itself to pay the representatives of the insured a certain sum of money at the end of the year in which he may die, provided his death occur within a certain number of years named in the policy. An endowment-policy is one in which the company promises to pay a fixed amount to the insured himself at a certain future time if he should then be alive. The premium may be paid wholly in advance, or at stated intervals, as the parties may agree. Children's endowment-policies are promises to pay, on a child's attaining the age of 18, 21, or 25 years, a specific amount. If the child die before the time named, the premiums paid will be returned or retained, according to the agreement of the parties as expressed in the policy. An endowment-insurance-policy combines the conditions of a pure endowment-policy with those of a term-policy, the company agreeing to pay a certain sum of money at a certain future time in case the person whose life is insured should then be alive, or at his death, if that should happen before the time agreed upon. A joint-life policy is one in which the company binds itself to pay a certain sum at the death of one or two or more persons named, on the joint continuance of whose lives insurance is made. Although there are still other varieties of policy, those above explained are the most important and fundamental.

In all cases where the continuance of the life of the insured is of pecuniary value to the company, the former is by the policy placed under certain conditions, a violation of which works forfeiture to the latter of the policy and of all sums that may have been

paid thereon. These conditions forbid the insured to travel in regions where human life is exposed to peculiar dangers, or to engage in certain hazardous occupations, or to take his own life. He is moreover bound to maintain the accuracy and truthfulness of all the declarations made in his application for insurance, any proved misrepresentation on his part working forfeiture. Suicide will not work a forfeiture if it be proved that the act was committed when the reasoning faculties of the insured were "so far impaired that he was not able to understand the moral character, the general nature, or the consequences and effect" of the same, or that he was "impelled thereto by an insane impulse which he had not power to resist." As to restrictions upon travel, residence, or occupation, they may be waived in any case under a written consent of the company. Policies are often surrendered after a certain number of payments have been made, the company paying therefor what is called the surrender value, which of course is generally a small sum compared with the aggregate of the premiums paid thereon. In some of the states the companies authorized to transact business therein are permitted to make a special deposit with the insurance department for the protection of policies duly registered in books kept by the department for that purpose, the state making itself responsible for the safe-keeping of such securities, which must always be kept equal to the value of the policies thus registered.

There are no statistics at hand which make a complete and accurate disclosure of the amount of business transacted by the life insurance companies of this country; but the following facts gathered from the last report of the New York superintendent indicate the vast extent of the business. The number of life insurance companies chartered by the state and doing business there in 1879 was 12; the number of companies chartered by other states and doing business there, 19—total 31. Number of policies in force in these companies in 1879, 595,486; total amount insured by these policies, \$1,439,961,265; total assets of these companies, \$401,515,793; gross liabilities, excepting capital, \$336,238,071; surplus as regards policy-holders, \$65,277,721; total amount of premiums, \$52,721,720; total income, \$76,174,954; excess of income over expenses, \$9,996,387; total number of policies issued in 1879, 67,399, amounting to \$167,865,390; policies terminated during the year, 67,661, amounting to \$176,606,626; policies terminated by death, 7,359, amounting to \$20,284,347; policies terminated by maturity, 4,804, amounting to \$9,043,849; policies terminated by surrender, 18,224, amounting to \$54,257,436. The figures from the last report of the insurance commissioner of Massachusetts are not less striking:—Number of policies issued in 1879 by the 30 companies doing business there, 66,358, amounting to \$165,802,173; number terminated during the year, 66,033, amounting to \$173,085,374; policies in force, 588,757, amounting to \$1,427,178,306; claims by death in 1879, 7,273, amounting to \$20,010,078; gross income of the companies, \$75,509,926; gross expenditures, \$66,734,530; gross assets, \$401,172,216; gross liabilities, \$362,734,965; surplus as regards policy-holders, \$43,119,151; net present value of policies or computed premium reserve, \$349,488,935. The policies are thus classified: Life-policies, 461,888, amounting to \$1,185,338,649, with a reserve of \$256,418,927. Endowment-policies, 109,361, amounting to \$202,704,494, with a reserve of \$90,123,671. All other policies, 17,508, amounting to \$39,135,163, with a reserve of \$3,534,006. Total reserve, \$350,076,604. These figures do not represent the complete aggregate of the business of life insurance in the United States. It is believed that the whole number of lives insured is not less than 1,100,000, while the aggregate sum insured is fully \$2,705,000,000—a sum amounting to one-twelfth of the entire capital wealth of the union. "There are in the country," says one authority, "more than half a million families who have voluntarily subjected themselves to a tax amounting in the aggregate to about \$100,000,000 a year, and are under bonds, more or less, in the aggregate amount of about \$400,000,000 to continue to pay this tax for life or for a longer period." These statements serve to show the enormous bulk of the business, and at the same time suggest to the political economist some problems of the highest importance to the public welfare, in respect to which great differences of opinion are known to exist.

Accident Insurance.—The system of insuring travelers and others against accident is of recent institution, as is that of the insurance of live-stock, plate-glass, and other fragile articles, and of steam-boilers against explosions. Accident insurance companies have become an important and popular institution in the United States, one such having paid nearly \$4,000,000, during 15 years of its existence, in indemnity for injuries and death losses. Of these companies there are but two in the United States, and five or six in England, the latter being about 35 years old, and the American companies 17; the English companies, however, have far fewer insurers than those in the United States.

INTERAMNA. See **TERNI.**

INTEREST (*ante*) is founded upon the principle that, as capital is the fruit of labor, its possessor is therefore entitled to compensation for its use. A general denial of this, by destroying one of the most powerful motives to industry, enterprise, frugality, and foresight, would, it is now generally believed, hinder the advancement of the human race in knowledge and virtue, if indeed it did not give it a direct impulse toward barbarism. It is the belief of the most enlightened political economists of the present day that much of the legislation upon this subject, intended as it has been to protect the poor from the assumed rapacity of the rich, has nevertheless been in reality a mistaken and injurious

kindness—an attempt to regulate by law that which might better be left to the discretion of the parties directly concerned. The interests of capital and labor are not conflicting but identical, and any legislation resting upon a contrary assumption is now seen to be injurious alike to both. The opprobrium cast, in the name of Christianity, upon the money-lender in the early centuries of our era, originated unquestionably in motives of benevolence; but it is now seen to have been founded in ignorance of the divine law of political economy. The money-lender may indeed abuse his power to the injury of the borrower, as the borrower may sometimes deceive the lender, but this is only the abuse of a thing not bad in itself. It was the growth of commercial enterprise under the influence of the Protestant reformation that first effectually undermined the ancient doctrines upon this subject; and the economists of the school of Locke, Hume, Adam Smith, and finally of Jeremy Bentham, did much to set the truth in a clear light. More and more the legislation of the world in respect to this subject is advancing toward an unreserved recognition of the principle that the rights of capital and labor rest upon one and the same foundation, and that the money-lender is not, any more than the money-borrower, necessarily a wrong-doer. In England, as long ago as 1854, all laws intended to prevent the taking of higher than legal rates of interest were repealed, borrowers and lenders being left free to make such agreements as might be mutually satisfactory. Some of the American states have, within a few years, followed the example of England, and the tendency of public sentiment in the United States is believed to be in the same direction. The generally prevailing rate of interest in the United States is 6 per cent, though in some of the states it is higher. In some states a particular rate is declared applicable to ordinary transactions where there is no specific agreement, but the parties are at liberty to stipulate for any rate that to them may seem good; if no rate be mentioned the legal rate is understood to be implied. No agreement to pay a higher than the legal rate can be enforced, unless such agreement is expressly authorized by statute, the established presumption of the law, in the absence of such legislation, being that such a rate is usurious. If there is a stipulation to pay a higher than the so-called legal rate of interest to the time of the maturity of the obligation, and nothing is said of the rate to be charged after that period in case of default, the weight of authority favors the conclusion that thenceforth the interest must be reckoned at the statutory rate. Sometimes an obligation to pay interest arises from well-established usage when there is no written contract to that effect; as where a debt is due upon account, and it is the general custom, within the knowledge of the debtor, to charge interest upon such claims after a certain time. Again, interest is recoverable as damages for failure to pay a debt or claim at the time it becomes due, though there be no contract to that effect, such interest being reckoned at the legal rate from the time when the debt should have been paid. For example: suppose a note of hand, without interest, to be due upon a certain day; if there be default of payment at the appointed time, the courts will award interest from that date until the note is paid. If judgment have been obtained for a debt, interest on the same is reckoned at the legal rate from the day the judgment was rendered. The common law upon this point has in this country generally been reversed. Upon unliquidated demands—i.e., demands, the amount of which, and the date when payment is due, have not been precisely fixed—interest is not collectible. If a man convert to his own use the personal property of another, interest upon the value of such property accrues from the time of its conversion. The custodians of trust funds and trustees of every sort will be required to pay interest in cases of maladministration of the sums intrusted to them. If a guardian or executor fail in his duty to account for or invest the trust-funds in his possession within a reasonable time, he is liable to pay interest thereon as damages for his delinquency, and, if the case be flagrant, compound interest may be charged. In ordinary transactions compound interest is not favorably regarded by the courts and is seldom enforced. Even a special agreement to pay interest at the compound rate will generally be treated as not binding. An obligation to pay compound interest may, however, arise from the usages of trade, and in such cases courts will exact payment. In the case of foreign contracts interest will be allowed at the legal rate of the place where the contract is to be performed. Specific legacies draw interest from the testator's death, but on general legacies, payable at a particular day, interest is not allowed till that day arrives.

INTERMEDIATE STATE. See ESCHIATOLOGY and FUTURE LIFE.

INTERMITTENT FEVER (*ante*), a form of fever characterized by febrile paroxysms and intermissions. It is also called fever and ague, chills and fever, shaking fever, and periodical fever. It belongs to the class of malarial fevers which are supposed to originate in the action of *marsh miasm*, which latter is, again, supposed to be produced principally by decomposing vegetable matter in swamps and low grounds. Post-mortem examinations in the few cases which are fatal reveal a condition of the liver, spleen, and brain called *bronzing*, and the presence of a dark pigment in the blood. More or less of this condition probably exists in cases not fatal. There is frequently an enlargement of the spleen, but this is not particularly characteristic of the disease, while the bronzing is. Intermittent fever may be divided into two distinct periods, the period of the paroxysm, and the period of intermission; or, the active and the quiescent. The paroxysm is divided into three distinct stages—the cold, the hot, and the sweating stage. There are usually some premonitory symptoms, but except in a few cases they are slight

and often unnoticed. The marked premonitory symptoms are headache and weariness, accompanied with yawning, but they are not characteristic, and serviceable only to those who have had, or suspect an attack of, the disease. The *cold stage* is ushered in with a feeling of chilliness in the back and limbs; there is also pain in these parts and headache. The skin and to some extent the subcutaneous muscles are contracted, producing that condition known as "goose flesh." A thermometer placed in the axilla, however, indicates an increase rather than a diminution of temperature, although exposed surfaces and the extremities are cooler than natural. Rigors, accompanied by regular shaking of a rhythmical character, are sometimes violent. The pulse is quickened, but small and feeble; the face very pale, and if the attack be severe, livid, as are the roots of the nails, the circulation in the fingers being almost completely suspended. The duration of this stage is variable, sometimes a few minutes, sometimes two hours; the average being about 40 minutes. The second or hot stage usually follows gradually, with flushings of heat, until a decidedly febrile condition is developed. The cold stage is sometimes absent, but is replaced by a nervous condition, or drowsiness, and sometimes coma (q.v.). This occurs in those cases which are called *malignant intermittent*, and which will be noticed further on. *Hot stage.*—The fever which follows the cold stage is often intense; the pulse is full and bounding, and the face crimson. The pain in the back and limbs ceases, but the headache continues. A thermometer placed in the axilla indicates a temperature of from 105° to 106° F., and there is great thirst. This stage lasts from three to eight hours, when the sweating stage commences, perspiration appearing first on the face, then passing to the body and limbs, while the heat, headache, thirst, and all other unpleasant symptoms gradually depart, the patient often passing into a natural slumber. This stage usually lasts three or four hours, when the paroxysmal or active period is over. The sweating is often, but not always, very profuse.

The period of intermission now commences, and according to its duration, before another paroxysm comes on, the disease receives certain distinguishing names, denoting certain types. If the paroxysm come on every day it is called a *quotidian* type. If the intermission be of two days' duration, that is to say, if the paroxysms succeed each other on the third days, the type is *tertian*. If three days intervene, or when the paroxysm reappears on the fourth day, the fever is said to be of the *quartan* type. The quotidian and tertian types are the most common, the quartan is rather rare. Statistics of the U. S. army show that the quotidian and tertian types occur with about equal frequency, but it is probable that the cases which come under observation in private practice would place the tertian form in the majority. Of 98,237 cases in the U. S. army, 51,623 were of the quotidian, 44,857 of the tertian, and 1757 of the quartan type. Cases have been reported of a quintan, a sextan, a heptan, and even an octave type, but in these cases it is not certain that there is sufficient regularity in the recurrence to justify a type title. The type frequently changes from a quotidian to a tertian, and sometimes to a quartan, or in the other direction; but a lengthening of the period of intermission is more common, especially if the patient be under mild treatment: active treatment generally eradicates the disease or causes a cessation of the paroxysms before a change of type can take place. The type may also be compound, that is, the quotidian paroxysm may occur twice every day, in which case it is called a *double quotidian*. In a *double tertian*, a paroxysm may take place every day, but they will have a different character on succeeding days; in other words, there will be two distinct forms of the tertian type, alternating with each other. Sometimes a double tertian occurs in which there are two paroxysms every other day. Another form is a *double quartan*, when a paroxysm occurs on two successive days, while there is none on the third day, the paroxysms being unlike. A *triple quartan* has also been observed, in which there are three successive paroxysms on three successive days, but differing from each other, as in the double forms. These forms are all rare, except the double tertian, which is not infrequent. In the period of intermission the condition of patients varies; some feel quite well, while others experience many unpleasant symptoms, such as loss of appetite, debility, headache, nausea, and sometimes palpitation of the heart. There is necessarily a more or less anæmic condition, even when the natural or individual force of the person impels him to shake off his unpleasant symptoms, and maintain his bodily and mental functions by activity. Every person laboring under the protracted influence of malarial poison generating intermittent fever has more or less of a *pinched* appearance. All the functions of nutrition are to a certain extent interfered with, sometimes producing enlargement of the spleen. The general appearance observed in persons laboring under intermittent fever is called by physicians *malarious cachexia*. Protracted continuance of the disease is liable to bring on a variety of organic difficulties, according to the constitution of the individual, the liver probably being the organ most often implicated. The causes of intermittent fever are obscure in one sense, yet the conditions which produce the disease are well known. Though marsh miasm is known as the principal factor in the generation of the disease, we cannot precisely state what marsh miasm is. Although, as will be noticed further on, certain low forms of vegetable life have been discovered and claimed to be present wherever intermittent fever prevails, and to be absent when it does not prevail, the observations have not yet been verified; and awaiting further investigations, we can assert only that there is in marsh miasm such a disease-generating

force. Wherever marsh miasm can be excluded as a factor, there intermittent fever is always absent. There are, however, marshy districts where intermittent fever does not prevail. It appears, therefore, that the marsh miasm which generates the fever is of a peculiar nature, or that the emanations of marshes are not always miasmatic; that there must be something added to the exhalations which arise from simple vegetable decomposition or decay, or that some peculiar organism must be developed which when taken into the system will produce the disease. Viewing the question in this light, the theory of the generation of intermittent fever which was proposed by Dr. J. H. Salisbury (an account of which is contained in the *American Journal of Medical Sciences* for Jan., 1866) deserves attention and careful test. Certain facts have long been known in regard to many of the conditions which propagate the disease. It does not prevail in high mountain regions where the soil is barren, or upon extensive sandy sea-beaches, where it is impossible for any of the products or peculiar accompaniments of marsh decomposition to be present. Therefore that a certain influence is generated in marshy districts which is capable of producing malarial fever cannot be doubted. The disease does not occur in those zones where the temperature never rises above 60°. Malarious influences increase as we approach the equator, and are noticeable along tide-waters where the shores are low and alternately inundated and left exposed to the heat of the sun. Turning up the soil or excavating for the streets of cities and for railroads, the clearing away of forests, and the consequent exposure of the rich soil to the action of the sun's rays, often converts a salubrious section into one exceedingly unhealthful. Many facts connected with malarial influence are worthy of notice. The malarial poison, whatever it is, seems to have a specific gravity. When it travels over the earth it keeps near the surface; persons occupying the upper stories of houses located on a malarious plain are less affected than those living nearer the ground, particularly if they remain in-doors after sunset, for it is another well remarked fact that night air contains more of the malarious influence than the air of day does, as though a degree of sensible moisture were necessary for its propagation. Now, the theory of Dr. Salisbury meets many of these facts. His observations were made on low-lands in the Ohio and Mississippi valleys, principally in the vicinity of Lancaster, Ohio. He discovered certain organisms in the expectorations of persons laboring under the disease, which he also found in the soil, or collected upon glass plates in the vicinity of the residence of the patient. He suspended glass plates at different elevations over different localities, and found that there was a certain level above which the malarial influence did not pass, and that this level was also the limit to the passage of these organisms. He also found that the organisms were not present in the dry air of day, arising only in the damp air of evening or night. The organisms in question are a species of algae resembling *palmelle*, which he found upon the surface of the soil, particularly where it had been disturbed, as by the feet of cattle, or by wagons. They have the appearance of green, red, and white incrustations, resembling a saline deposit from evaporation. Dr. Salisbury has given the name *geniasma* to the plant, to which he also applies the name of *ague plant*. He enumerates the following species: *G. rubrum*, *G. veridans*, *G. paludis*, *G. plumosus*, *G. alba*. Dr. Salisbury remarks that the lesions in intermittent fever, are confined mostly to epithelial structures, and therefore the liver and spleen are organs that suffer specially, and refers to a case reported by Morgagni in which the spleen weighed 8 lbs., and to one by Bailly in which it weighed 10 lbs., and was a mere mass of pulp. Dr. Salisbury found the *ague plant* in the urine of the patients; if the plant be the cause of intermittent fever, this would form a diagnostic symptom of value in obscure cases. Dr. Salisbury states (Oct., 1880) that subsequent observations have, in his opinion, confirmed the results of his investigations as published in 1866.

Treatment.—It may be said with great confidence that intermittent fever is one of the few diseases which the physician expects to combat successfully by the administration of drugs. There are drugs which have a specific curative action, and also those which have a decidedly beneficial effect as adjuvants. The principal specific remedy is *Peruvian bark*, or its alkaloids, which are commonly preferred. Of these, *quinine* and *cinchonidia*, usually in the form of sulphates, are most used. Quinia has been long in use as an antiperiodic, but cinchonidia is a recent introduction. It is much less expensive than quinia, and by many its action is preferred, as being milder and more permanent. The dose of quinia varies with the constitution and condition of the patient, but as a general statement, in a case of well developed tertian, the cure will require from 20 to 60 grains of quinia sulphate, or one-half more of cinchonidia, divided into 5 or 10 repeated doses; and it is advisable to give in connection some alkaline salt, as the bicarbonate of soda, or of potash; or when a laxative effect is desired, Rochelle salts. It is often advisable to precede the administration of the anti-periodic with a cathartic, and for this purpose there is nothing better, if the patient will consent to take it, than powdered rhubarb, in the dose of a dram or more. Less may be given if combined with one-half or one grain of podophyllin; or podophyllin may be given alone, or combined with five or six grains of calomel. The quinia or cinchonidia is often given to the extent of producing ringing in the ears, one of the symptoms of *quininism*. This, however, is not always advisable or necessary; a continued use of one of these remedies during convalescence, in conjunction with some preparation of iron, generally meets the demands of the case.

Dr. Gaspar Griswold of New York has used the alkaloid of jaborandi, in the form of *muriate of pilocarpin*, in a number of cases of intermittent fever, and his reports in the *Medical Record* indicate that the remedy possesses great value. It does not appear that the remedy has any specific action on the *materies morbi* of the disease, as many suppose to be the case with quinia, but that it breaks up the stages of the attack in consequence of its powerful diaphoretic qualities. Dr. Griswold administers it hypodermically, using from one-sixth to one-fifth of a grain, dissolved in water at the commencement of the cold stage. The effect is to bring on the second or sweating stage in a few minutes, thus abolishing the hot stage.

The results in one of the cases which occurred in 1879 are given in the following table:

1st paroxysm, no treatment.			2d paroxysm. Hypodermic injection of $\frac{1}{2}$ gr. of pilocarp. mur. at 11.09 A.M.		
Time.	Temp. of Axilla.		Time.	Temp. of Axilla.	
11.15 A.M.	101 $\frac{1}{2}$	Chill. Fever: Sweat.	11.05 A.M.	102	
11.45 "	103		11.35 "	100 $\frac{1}{2}$	
12.15 P.M.	103 $\frac{1}{2}$		12.05 P.M.	99 $\frac{1}{2}$	
12.45 "	104		12.35 "	99 $\frac{1}{2}$	
1.15 "	105		1.05 "	99 $\frac{1}{2}$	
1.45 "	104 $\frac{1}{2}$		1.35 "	99	
2.15 "	103 $\frac{1}{2}$		2.05 "	99 $\frac{1}{2}$	
2.45 "	102 $\frac{1}{2}$		2.35 "	99 $\frac{1}{2}$	
3.15 "	100 $\frac{1}{2}$		3.05 "	99	
3.45 "	99		3.35 "	99	

The patient had no more chills during the next ten days without further treatment, and was discharged as cured. These results, if verified, may change somewhat prevalent views in regard to the therapeutic action of quinia. Here we have a remedy which seems to act by interrupting the stages of the paroxysm; but jaborandi may possibly have some specific action also.

Malignant intermittent or Pernicious intermittent fever, sometimes called *Congestive intermittent*.—Intermittent fever, ordinarily not a dangerous disease, has a form the cause of which is not always discoverable, but which is one of the most fatal diseases. Fortunately the cases are rare, except during certain seasons, in very malarious regions. It is more prevalent in the southern and western states, as the level portions of Alabama, Mississippi, Louisiana, and about the estuaries of some of the creeks and rivers emptying into the great lakes. Sometimes the malignant character of the attack is not manifested in the first paroxysm, or even the second, and is thus likely to deceive the practitioner; but it often reveals itself in the first paroxysm, and may then cause death. Prof. Drake states that the first symptoms, however, are more or less anomalous, and will give warning, especially if other cases have taken place in the neighborhood. The symptoms vary, and yet to the experienced are characteristic, taken in connection with the history. The patient becomes rapidly delirious, or stupid, or comatose; or coma may follow delirium. Sometimes epileptiform convulsions occur. In some cases there is very great sweating, and sometimes the extremities become as cold as marble. Sometimes there is vomiting and purging, followed by a collapse, as in cholera. Sometimes the urine fails to be secreted, and frequently there is albuminuria. There is often hemorrhage from the stomach, bowels, or kidneys, or all of these organs. The pulse is small and irregular, and there is often great difficulty in breathing. If the pulse gets fuller the patient may get relief, but if the paroxysm passes off without much improvement, the next one will not unlikely prove fatal. The pathological conditions found after death do not differ essentially from those found after death from ordinary intermittent fever, except that they are intensified; and it is possible that the disease is caused by the generation within the system of an excessive amount of malarial poison, the eliminative functions of the system not having acted. During the prevalence of intermittent fever, if there be a tendency to the malignant type, the number of these cases will be diminished by adopting, generally, prompt, active, and sustaining treatment. During the paroxysm the application of warmth in various ways, by warm blankets, bottles of hot water, hot bricks, or other materials, as sinapisms, should be made. The administration of chloroform, in dram doses, is recommended on good authority, the dose being repeated, if necessary, till anæsthesia is produced. But the chief reliance for the expulsion of the disease is in the administration of quinia or cinchonidia, and the action of either of these medicines will be much promoted by giving it in connection with those simple alkalies which have been found to give activity to the secreting functions of the skin and glandular organs, such as the carbonates of soda and potash. Ammoniacal carbonate may also be found useful. Wine is demanded, probably in every case, and all possible means of supporting the strength should be employed. The diet should be carefully selected with great regard to the condition of the patient. Beef-tea, the staff diet of the sick-room, is not to be omitted, and steak may be chewed and the juices swallowed if the patient have any appetite for it. All articles of food should be liberally salted. The axiom that recovery from disease consists in regeneration of tissue should not be lost sight of in the treatment of

this disease more than in any other. The nervous system should be supplied with the best products of nutrition. During a state of coma, or at other times, if the stomach be irritable, quinia may be administered by means of a hypodermic syringe. The drug is dissolved in water containing 10 drops of sulphuric acid to the ounce, and from 20 to 40 grains are sometimes administered. The chief objection to this mode is in the bulk of the injection, and the inflammatory swellings that are liable to ensue. But these must be regarded in connection with the dangerous condition of the patient. Tepid bathing must not be neglected. If recovery takes place, but the malarious cachexia remain, a change of air and climate will be advisable, and the place selected should have an atmosphere as pure as possible. Colorado possesses the climatic conditions desirable in such cases.

INTERNAL REVENUE. See REVENUE.

INTERNATIONAL COPYRIGHT. See COPYRIGHT, *ante*.

INTERNATIONAL DATE-LINE.—The line at which dates change, being made later by one day by those who cross the line from east to west, and earlier by one day by those crossing it from west to east.

If a person start at midday, that is, when the sun was shining perpendicularly on the meridian that passes through the place of starting, and travel westward, keeping pace with the sun, thus keeping the sun directly over the meridian of the place at which he might be, he would make a complete journey around the globe in twenty-four hours, and return to his place of starting at noon the next day. Twenty-four hours would have passed, but to the traveler the sun would have been shining perpendicularly as at noon all the time; and the question arises, when or at what point did the traveler change from noon of one day to noon of the next? For instance, if he should start at Monday noon and keep the sun in the zenith, he would arrive at the place of starting Tuesday noon—it would be noon-day to him during the whole journey of twenty-four hours—Monday noon would change to Tuesday noon without an intervening night: where would the change occur? It is to him apparently still Monday noon, and to obtain the correct date he must drop a day. The reason for dropping a day can be more fully shown as follows:—Remembering that the earth makes one complete revolution on its axis in twenty-four hours, and thus the sun in its apparent diurnal revolution moves over 360 degrees of space in twenty-four hours, it thus moves over 15 degrees of space in one hour, from which it is evident that the difference in longitude which causes the difference in the relative time, may be estimated in time, allowing 15 degrees to an hour, or one degree to four minutes. Therefore, suppose a man starting from any given point, travel one degree w., his watch, instead of marking 12 o'clock at noon, according to the correct time at that place, would mark four minutes after twelve. Let him travel w. 15 degrees, and he will find that 1 o'clock by his watch will be noon-day by the sun. Let him go on to 120 degrees, and when the sun is in the zenith his watch will indicate eight o'clock p.m. Completing his journey around the globe, he will have gained, in this manner, twenty-four hours. From this it will be seen that in order to obtain the correct date twenty-four hours must be subtracted from his time. On the other hand, if a person could travel eastward at the same speed with which the sun apparently travels westward (the same rate of speed with which the earth revolves on its axis), if he should start on his journey at noon-day, he would meet the sun when exactly on the opposite side of the earth from the place of starting, and continuing the journey would again meet the sun at the place of starting, thus seeing three noon-days within the twenty-four hours, or apparently gaining a day. This we know to be impossible, since only twenty-four hours of time have passed, while in reality an extra period of light has been gained, and thus to obtain the correct local date a day must be added to your time.

From this we see that, for every time a person travels around the earth in either direction, there is a difference in time of one day, and the result is the same regardless of the rate of speed. To avoid the confusion of dates which must necessarily result from this constant gain on one side and loss on the other, it has been proposed to determine upon some line at which eastern bound travelers shall add a day, and westward bound travelers shall drop a day from their reckoning, and thus prevent a disagreement in regard to the day of the week. The line at which this addition or subtraction shall be made is what is meant by the date-line.

The fact and necessity of such a date-line may be shown in a way with which all are familiar. Take a simple problem in arithmetic on "longitude and time." "When it is 9 o'clock A.M., May 1, at Singapore, long. 104° e., what time is it at Manila, long. 121° 30' e.?" The difference of longitude estimated *eastward* from Singapore is 17° 30'. The application of the ordinary rules of arithmetic gives for an answer, 10 h. 10 m. May 1. But the difference of longitude estimated *westward* from Singapore is 342° 30', giving for an answer 10:10 A.M., April 30. This shows that when the time of day at one place is known, and the longitudes of both places known, the time of day at the other may be obtained in two ways, viz.: by using the difference of longitude estimated west, or estimated east. But the dates thus obtained differ by one day; which is correct? Sometimes the one and sometimes the other. In the problem just considered the latter result is correct. In such problems the difference of longitude must be taken in such a direc-

tion as not to come across the date line; or if the date-line be crossed, the dates must be changed in accordance with the above definition.

The calendars in general use throughout the civilized world originated in Rome. The one most generally adopted is the Gregorian. Russia, and all other countries of the Greek church, still use the Julian calendar. The two calendars differ as to the day of the month, but agree as to the day of the week. Which ever calendar is used, all places received their date from Rome. Places receiving dates by westward communication from Rome would naturally be considered earlier in time, at the same instant, and those places receiving dates by eastward communication would be considered later in time at the same instant; and date-lines would naturally occur where these directions of communications met. Such is the fact. The western part of Europe, the islands of the Atlantic ocean, the whole of South America, and the greater part of North America, have received civilization by westward communication from Rome. Therefore there is no date-line in the Atlantic or in America (since the occupation of Alaska by the United States). The eastern part of Europe and Asia received civilization by eastward communication from Rome. Date-lines, therefore, occur in the Pacific ocean between islands that have received dates by eastward, and those that have received by westward communication. By connecting these lines we have an irregular line whose general direction is n. and s., and which may properly be called the date-line, though not always, and perhaps not usually, the line where *vessels* change dates. The north-western part of North America, otherwise known as Russian America, now Alaska, received civilization by eastward communication, therefore their dates would correspond with those of Asia; but the north-western part of British America received civilization by westward communication, thus the dates there would correspond with eastern America and Europe. From this we see that two neighbors, one living in Russian America and one in British America, might differ as to the day of the week. This was often the case before Alaska was purchased from Russia by the United States in 1867. The dating in Alaska has been put back to conform with the rest of the United States. The date-line, therefore, must now pass through Behring's straits, or, according to some authorities, just w. of the strait. North of the strait some authorities claim that it passes between Plover and Herald islands, which holds, as the former was discovered from the eastern continent and the latter from the western. South of the strait it passes w. of Clarke's or St. Lawrence island. Thence it passes w. of Gores island; thence south-westerly between the Aleutian islands and Asia. It thence passes south-westerly some degrees e. of cape Lopatka and the group of Kurile islands, thence just e. of the Japan islands, Jesso and Nippon, keeping w. of Guadalupa and Margaret's islands, but e. of Bonin, Loo Choo, and Patchoo islands, and s.e. of Formosa. This island was unknown to the Chinese until about 1403. About 1634 the Dutch established themselves here, and built fort Zeland on a small island commanding the harbor of the capital Taeman. After retaining possession for 28 years, they were expelled by Coxigina, a famous Chinese rebel, whose successors ruled until 1683, when it was taken by the Chinese. It thus retains the same dating as the Chinese nation proper. The line then passes through Bashee channel, just n. of the Bashee islands. It enters the China sea e. of Hong Kong. It then passes s. just w. of the Philippine islands, but keeps e. of Palawan island. It is here that it reaches its most western point, being about 116° e. longitude. It then takes a south-easterly course, passing through the Sooloo islands, s. of Mindanao and n. of Gilolo. Thence it passes e. nearly parallel with, but just n. of, the equator to a point about 165° just n. of Shank island; thence south-easterly, leaving High island, Gilbert archipelago, Taswell islands, and the De Peyster group on the n.e.; thence to a point n.e. of the Navigator or Samoan islands to longitude about 268° w.; thence it turns s., keeping e. of the Navigator, Friendly, Tonga, Vasquez, Kermadec, and Curtis islands, and w. of the Society islands, and Cook's or Harvey islands; thence it continues s., bearing a little to the w., so as to cross, according to some authorities, Chatham island; thence to the south pole. By following this description the line can be traced with a pencil on a map of the world.

The popular idea seems to be that 180° e. or w. of Greenwich is the point at which the change occurs. National pride is not likely to give England the right to consider the 180° w. of Greenwich as having any special advantage over the 180° w. of Berlin, Paris, Vienna, Rome, Madrid, St. Petersburg, or even Washington, D. C. A vessel sailing from San Francisco to Samoa would reach its destination before reaching 180° w. of Greenwich, and would find itself a day behind the Samoans in date. Other illustrations might be given to show that the 180° fiction does not remove the difficulty. For instance: the Spaniards on the Philippine islands still use the latest dating; a navigator sailing from San Francisco to these islands, who had changed his date at 180° , would find himself a day ahead on his arrival. This would not be the case if he had sailed to Yokohama or Hong Kong, which have the advance dating. In making a round trip from San Francisco to Yokohama, a navigator might keep his dating unchanged and thus be right on his return, or he might make two changes, skipping a day on his outward voyage at any time or place on the way, and dropping a day at any time or place on his return. Cruising vessels are said not to regard the 180° in their dates, as they might in some cases have to change their dating very frequently.

Numerous proposals have been made for an initial meridian for all nations, in order

to dispense with the many now in use, but no satisfactory proposition has yet been made. M. de Beaumont suggests one passing through Behring's strait. Rome has also been suggested for various reasons, among them the fact that it was the home of old and new style, and need not offend national pride; and because it is nearly on the meridian of Copenhagen, Uraniburg, Leipsic, Munich, Padua, Venice, Christiana, Gotha, Verona, and Modena, and not far w. of those of Berlin, Prague, Naples, and Palermo. This meridian band has been called the great street of the world's observatories. With this suggestion there has been coupled the suggestion that Rome be made 180°, and that 0° be left unmarked, passing somewhere along Behring's straits, and that e. and w. as applied to longitude be dispensed with.

Another point may be noted. Taking the line as described, its most western point on the Philippine islands is 117° e., and the most eastern point is 168° w. longitude. Using these limits, from the time any given time or day begins to the time it ends is 53 hours. Or taking the eastern part of Alaska, as was formerly done, which is 130° e., and a day remains on the face of the earth for 55 hours and 32 seconds. Taking the former, we can see that for 5 hours each day, by the same calendar, there are three different dates in different parts of the world. These hours in Washington, D. C., and all places on or near that meridian, are from 6:10 A.M. to 11:10 A.M. For instance, during these hours of to-day, Jan. 1, 1881, with us, the Navigator islands are in the early part of Jan. 2, and the Philippine islands are finishing Dec. 31, 1880.

INTERNATIONAL LAW (*ante*) is the body of rules, derived from custom or from treaty, by which nations, either tacitly or expressly, agree to be governed in their intercourse with each other. Some of the rules have existed from the beginning of history; their number has gradually increased, their scope widened, and their quality improved. The Amphictyonic council, formed in very early times and limited to Grecian tribes, required that after a battle an exchange of prisoners should be made, and a truce declared in order that the dead might be buried. They also bound themselves not to destroy any city included in the alliance, or to cut it off from running water in war or peace. The Romans in their early days established a college of heralds for declaring war, and allowed only sworn soldiers to take part in it. The influence of Christianity, declaring the universal brotherhood of man as one of its fundamental truths, has been great and beneficent in the sphere of national character and intercourse. Many barbarities fell at once before it, and many others have been gradually mitigated and subdued.

International law has two natural divisions—the one containing rules for the intercourse of nations during peace, and the other regulating the changes made by war.

I. *Rights and duties of nations during peace.*

1. The parties to international law. Individuals cannot be parties; but may, if strangers, claim humane treatment under the law of nature broader than that of nations. Only independent, organized communities are nations, and have the power of making treaties with other nations. Protected or dependent states, provinces and colonies, the members of confederacies, and separate kingdoms made one by a permanent compact, must conduct all their intercourse with other nations through that nation on which they are dependent, or of which they are a part. No particular form of government and no difference of religious belief necessarily excludes a nation from the obligations and advantages of international law. Independent states have equal duties and rights, without reference to their size or other relative differences, and are sovereign in the sense of having no political superior. The individual states of the American union may be said to have a certain local and relative sovereignty; but with respect to other nations the United States only constitute a sovereign state. International law deals only with state *de facto*. While a body, hitherto dependent or forming a part of a nation, is striving to effect its independence, other nations cannot help it, without creating a state of war with the parent state. A state cannot evade its obligations by change of constitution. Denmark and Norway, when separating in 1814, each took its share of the debt of the united kingdom; and the United States assumed the debts of the preceding confederation. The independence of a state implies, first of all, freedom in the conduct of its internal affairs. Generally there can be no legal interference with them by another state. Yet when a state, by external alliances, is increasing its power in a degree that endangers the welfare or tranquility of its neighbors, the right of interfering in order to preserve the balance of power is claimed and has been exercised; as, for example, in the war of the Spanish succession, and after the French revolution and the fall of Napoleon. On the other hand, when circumstances do not require or warrant such an interference, there have been national declarations designed to forestall and prevent it. An instance of this was furnished by what is called the Monroe doctrine—president Monroe's declaration made in order to prevent European interference in what had been Spanish America—that "the United States would consider any attempt on the part of the allied European powers to extend their system to any portion of our hemisphere as dangerous to our peace and safety." Also when any great cruelty has been practiced by the strong against the weak the right of interference by other nations is claimed. A signal instance was furnished in 1827, during the struggle for independence by the Greeks against the Turks, when the allied fleets of Great Britain, France, and Russia destroyed the Turkish fleet.

2. A state has a sovereign right to its territories and property. Its property consists of public buildings, forts, ships, lands, money, and similar possessions. All private property, also, within its limits is under its protection. Its territory includes all the surface of land or water within its limits; of harbors, gulfs, and straits within certain headlands; and of the sea within a league from the shore. Outside of this limit the sea is free to all nations for commerce and fishing. But while foreigners are free to catch fish in any part of the ocean contiguous to the territory of a state—as on the banks of Newfoundland—they cannot dry their nets or cure their fish on the adjoining coasts unless the privilege have been granted by treaty. A ship owned by inhabitants of a country cannot be regarded as national territory, but is simply private property under the protection of the national flag. In a foreign port it may be attached for debt, and its crew are accountable to the laws of the port and of the country for any misconduct which they may commit. Rivers between two countries, unless a contrary provision is made by treaty, are common to both, and the boundary runs through the principal channel. When a river rises in one state and enters the sea in another, each portion, strictly speaking, is subject to the state within whose limits it is contained. The dwellers on the upper shores have no right, except by concession, to descend to the sea through the lower territory. Yet there seems to be an equitable claim to the privilege almost amounting to a right; and within the present century almost all such navigable rivers in the Christian world have been opened by treaty to the use of those who live on their upper waters. Among these may be mentioned the Rhine, Scheldt, Danube, La Plata and its tributaries, Amazon, and St. Lawrence.

3. Duties which foreigners coming into a country owe to its laws and government. Aliens, sojourning in a country, must submit to its laws unless released from their jurisdiction by special treaty or international custom. They are secure in the enjoyment of their property, the use of the courts, and the transaction of lawful business. They can dispose of their property by will to persons residing abroad, or can transmit it to their own country. They have also the protection of consuls and ambassadors appointed by their own country. Several classes of persons are specially exempt, in a greater or less degree, from the jurisdiction of local laws; as, for example, sovereigns traveling through a foreign country, ambassadors accredited to it, the officers and men of national ships in its ports, and foreign armies when passing through it by permission. In England formerly no one born a subject could lawfully expatriate himself, nor could any foreigner be naturalized except by special act of parliament. But in 1844 provision was made for granting foreigners all the rights of native-born subjects except membership of the privy council or of parliament. In the United States a foreigner may be legally naturalized after five years' residence, and three years after he has formally declared his intention to renounce his former nationality and become a citizen. Persons who have committed an offense against the laws of their country often flee for refuge into another. If the offense be political only, the nations which are most free themselves generally allow the fugitives to remain; but if they have committed, or are charged with crime, they may be delivered up for trial to their own country when demanded according to the provisions of treaties made for the purpose. An ambassador in very ancient times was considered a sacred person; and, as national intercourse and comity have been enlarged, there has been a proportionate increase in his rights and privileges. His person, dwelling-place, property, family, and attendants, are, in a great degree and as a rule, exempt from the criminal and civil jurisdiction of the country to which he is sent. He has liberty of worship, according to the customs of his country and to his own choice, for himself, his household, and by extension of courtesy, for other persons belonging to his nation. In some countries this liberty has been restricted to worship in his own house. Consuls are agents who have no diplomatic character, but are sent to reside in certain districts to protect the interests, chiefly commercial, of the country which appoints them. Their duties are imposed by their own government, and are performed by permission of the foreign power. They are honored and protected by the flag of their country; but their privileges are, in general, much less than those of ambassadors, except in Mohammedan countries, where, having often been required to perform diplomatic duties, they have acquired corresponding rights. The modern office of consul arose in the commercial times of the middle ages, when companies of merchants, going to reside in the eastern parts of the Mediterranean, had officers, chosen at first by themselves and afterwards by their governments, to settle disputes that arose in conducting business affairs. Treaties are compacts between nations for the regulation of intercourse between both governments and people. They comprise, in a great measure, the history of international law. The power to make them is determined by the constitution of individual states. In the United States they are negotiated under the direction of the president, and are ratified by a two-thirds vote of the senate. When they promise the payment of money it must be appropriated for the purpose by a vote of the house of representatives.

II. *International relations as modified by war.*

1. War is a contention by force of arms between two or more nations. In order to be just it must be necessarily undertaken to repel an injury or to obtain a righteous demand. The power of deciding for what purpose and when it is to be waged must be left to each nation, because there can be no other judge. A nation that has been wronged, or thinks it has, may take no notice of the wrong, or employ only peaceful measures to obtain

redress, or accept the offered mediation of a friendly power, or propose arbitration, or use armed force. In general, other nations have no right to interfere. Yet, in some cases, war between two nations may become to other nations a cause for war. Mediation offers a way for escaping war which may be equally honorable and advantageous to both parties. Yet it can only give advice which may be rejected by one or both of the parties. Arbitration, in special cases, may be simple, easy, and effective. The parties agree on the arbitrators, the points to be considered, the time and place, and the law which is to govern the case; and they bind themselves to abide by the decision. The success which has, in numerous instances within the present century, been attained by arbitration, and especially in the recent important case between the United States and Great Britain arising out of the war for the suppression of the southern rebellion, warrants the hope that war may often, in a similar way, be avoided. After the happy settlement in the instance last mentioned, the British house of commons presented an address to the queen, praying that measures might be taken "with a view to further improvement in international law and the establishment of a general and permanent system of international arbitration."

2. War between two nations interrupts all recognized intercourse between the individuals members of each. The relations of commerce, the right given by treaty to reside in either country, and all communication by direct channels between them, come to an end. Sometimes permission is granted to remain still in the country; and generally time is granted to remove with property and effects. The treaty of 1794 between the United States and Great Britain stipulates that "neither the debts due from individuals of the one nation to individuals of the other, nor shares nor moneys which they may have in the public funds or in the public or private banks, shall ever, in any event of war or national difference, be sequestered or confiscated." According to chancellor Kent, "as a general rule, the obligations of treaties are dissipated by hostilities." It is said also by another writer that "Great Britain, in practice, admits of no exception to the rule that all treaties, as such, are brought to an end by a subsequent war between the parties." The peace of Westphalia and the treaty of Utrecht have been renewed several times when the nations concerned in them, after having been at war, were making new treaties of peace.

3. The interests of humanity demand that, during warlike operations on land, non-combatants should be molested as little as possible in the prosecution of their peaceful interests and in the enjoyment of their homes. On the sea, ships and cargoes belonging to enemies have, until recently, been accounted lawful prey; but in the enlarged commercial relations of the world much progress has been made towards exempting innocent traffic on the seas from interruption during war.

4. The forces lawfully employed in war are, on land, regular armies, militia, and volunteers; and, on the sea, national ships and private vessels commissioned by national authority. But as privateering is necessarily attended with great evils, earnest efforts have been made to restrict or abolish it. In 1856 the parties to the declaration of Paris adopted four rules concerning maritime warfare, one of which declares that "privateering is and remains abolished." Other nations were asked to accept them on condition that they would be bound by them all; and almost all Christian states did agree to them. The United States withheld their assent because, as it is their policy to maintain only a small navy, the right to resort to privateering in case of war offers the only way by which they can cope with the large navies of other nations. They agreed, however, to adopt all the rules, provided the signers of the declaration would consent to exempt from capture all innocent traffic of enemies on the sea. In 1861 the offer was made to two of the principal European powers, by the secretary of state, on the part of the United States, to come under the operation of the four rules; but as it was made for the whole republic—the rebellious as well as the loyal states—it was declined.

5. The rights and duties of neutral nations. In recent times the commercial intercourse among people of different nations has become so general and constant, that they are practically united almost into a confederacy so as to be entitled to a voice in deciding whether war between individual nations shall, in any particular case, be permitted. Sometimes, in view of peculiarities in its position, a territory is made permanently neutral so that armies cannot cross its boundaries nor can it engage in war. Switzerland and part of Savoy, since 1815, and Belgium, since 1830, have been in this condition. Sometimes several powers unite in an armed neutrality in order to maintain certain maritime rights against both belligerents. But such a league is liable to result in war. A neutral state must be impartial in its dealings with both belligerents; must keep itself, its territory and subjects, as detached as possible from the war; and be equally humane to both parties when storm, disaster, or hunger casts them on its shores or within its bounds. By the treaty of Washington, in 1871, Great Britain and the United States adopted three rules to be applied in settling difficulties then existing between them, to be observed by them in future, and to be urged on the acceptance of other nations. These rules are—that "a neutral government is bound, *first*, to use due diligence to prevent the fitting out, arming, or equipping, within its jurisdiction, of any vessel which it has reasonable ground to believe is intended to cruise or to carry on war against a power with which it is at peace; and also to use like diligence to prevent the departure from its jurisdiction of any vessel intended to cruise or carry on war as above, such

vessel having been specially adapted, in whole or in part, within such jurisdiction, to warlike use: *second*, not to permit or suffer either belligerent to make use of its ports or waters as the base of naval operations against the other; or for the purpose of the renewal or augmentation of military supplies or arms, or the recruitment of men: *third*, to exercise due diligence in its own ports and waters, and as to all persons within its jurisdiction, to prevent any violation of the foregoing obligations and duties."

6. The liabilities and rights of neutral trade. By the rules set forth in the declaration of Paris, a "neutral flag covers the enemy's goods with the exception of contraband of war," and "neutral goods, with the exception of contraband of war, are not liable to capture under an enemy's flag." The term "contraband of war" is used to denote articles which directly aid warlike operations. According to a formula adopted by the United States, the list includes all kinds of guns, fire-arms, ammunition, weapons, armor, military clothing, equipments for men and cavalry horses, and all instruments, of any material, manufactured and prepared for making war by sea or land. The right of blockade in time of war is universally admitted, but in general is available only for harbors, mouths of rivers, and limited districts of coast. As a blockade begins and ends at definite times, previous notification, of both its beginning and ending, must be given to traders and neutral governments. To be legal, it must be maintained by armed force sufficient to show that it is actual, and to prevent all ordinary and open attempts to pass it. All merely formal, or, as they have been called, paper blockades, like Napoleon's Berlin and Milan decrees and the two counter British orders in council in 1807, are regarded by international law as futile and void. When a vessel is captured and found guilty of attempting to enter or leave a blockaded port, the penalty it incurs is the confiscation of itself and its cargo. In carrying out the international rules adopted concerning contraband goods, enemies' goods on enemies' ships, and blockades, search is often necessary to determine the nationality of the vessel and the nature of its cargo. It must be submitted to by the vessel, but must not be so conducted as to give unnecessary annoyance. The right of search is a war right applicable to merchant vessels only in time of war, and to those suspected of piracy at any time, inasmuch as piracy involving attack on the peaceful and unarmed, is held to be war against the human race.

INTERNATIONAL WORKINGMEN'S ASSOCIATION, commonly known as the International, organized in 1864 at London by an assemblage of workmen from the principal countries of Europe, is an association of trades-unions designed to protect the working-classes against the power of capitalists, and seeking to overthrow the system of paying labor with wages by substituting for it national co-operative associations. The programme and rules for its government drawn up by Dr. Carl Marx were finally adopted, in preference to those of Mazzini and Bakunin, at the first general congress, held at Geneva, Sept., 1866. The reasons assigned for forming the association were: 1. That the emancipation of labor must be accomplished by workingmen themselves. 2. That the struggle to effect it is a struggle, not for class privileges and monopolies, but for equal rights and duties with an abrogation of class rule. 3. That the economical subjection of laborers to capitalists—who monopolize the means of labor—that is, the sources of life—lies at the foundation of servitude in all its forms, of all social unhappiness, mental inferiority and political bondage. 4. That the economical deliverance of the working classes is, therefore, the first great end which political movements ought to seek. 5. That efforts in this direction have, thus far, been unsuccessful because of the want of union among the departments of labor in each country, and among the working classes of different countries. 6. That the emancipation sought for is not a merely local or even national problem; but one which, embracing all countries where modern society exists, requires especially the co-operation of the most advanced nations. 7. That the present revival of effort among the working-classes in the principal countries of Europe, while it may animate their hope, should also warn them against a repetition of their old errors, and calls on them to consolidate immediately the various disconnected movements among themselves. Three subsequent meetings of the general congress were regularly held; but the fifth meeting, which was to have been at Paris in 1870, was prevented by the war between France and Prussia, and since that time no meeting has been held. The influence of the association has been extensive and effective. The strikes of the bronze workers in Paris, 1867, and of the builders in Geneva, 1868, were sustained and made successful by English money; and in England the power of trades-unions and of strikes was greatly increased, through the power which the association exerted in preventing the master-workmen from obtaining supplies of laborers in other lands. The movement encountered a very severe check during the Franco-Prussian war. Many of the Paris communists belonged to the association, and it defended their excesses in a pamphlet written by Marx and published by the general council at London. But while its operation is at present less public—even its visible organization having been broken up or suspended—its importance is maintained by an increased efficiency among the national unions, and by the establishment in all the principal countries, of organs for diffusing its ideas.

It is a curiously interesting fact that we owe the International to an occasion on which it would be least of all expected that such an institution would arise. That occasion was the international exhibition held in London in 1862, operating through the visit paid by French workmen, on the invitation of their English brothers. In accordance

with this invitation, delegates were sent from the different French trades-unions, and these men inspected carefully the exhibits and processes displayed at Kensington, and duly reported their opinions and impressions to the labor organizations which they represented. But besides this semi-official duty, they assumed another, which appears to have been thrust upon them—perhaps innocently enough—from both sides of the channel, that of investigating the relations of English laborers to their employers, and of comparing notes as to the relative conditions of labor in the two countries. On Aug. 5, 1862, at a tavern in London, a meeting of the delegates and of English workmen was held, which may be considered to have been the first step towards international labor organization. At this meeting an address was read by the English workmen, which, while harmless enough in its sense and in its wording, contained the secret cause of all labor struggles, since it recited the reasons for dissatisfaction on the part of the laboring class, while it recommended international association as a remedy. The existing objectionable conditions of labor were stated to be competition, disputes as to wages, and the increasing introduction of machinery. The French delegates were not only cordially received and liberally treated by their English comrades, but, moreover, inducements were held out to certain of them to remain in England for the purpose of conference and study as to the most advantageous plan on which to organize vast strikes which should be sustained by the full power of international associated effort. In 1863, by taking advantage of a manifestation in favor of Poland, a pretext was found for a reunion, at which the organization was still further advanced. And now it needed only certain changes in the French laws to make the new society permanent and powerful. This was effected by a fortunate bill which passed the French *corps législatif* in 1864, by which coalitions were authorized in France.

On Sept. 28, 1864, at the grand international meeting at St. Martin's hall, in London, the provisional regulations of the "international association" were adopted, and these were ratified two years later, in the first congress of the Internationals, held at Geneva. Progress now became rapid in the new organization. A bureau for the receipt of subscriptions was opened in Paris, and met with general patronage on the part of the workmen. Subordinate societies, or "groups," were formed in Germany, Switzerland, Italy, Denmark, and Belgium. Journals were established, and widely circulated, advocating the views of the international, which already began to oppose its conclusions to those of the cabinets and courts of Europe. The outbreak of the Franco-German war presented an opportunity which was not neglected. The formation of battalions of the national guard in Paris was aided by the Internationals to the extent of infusing as much of their own element into them as was practicable, with the design of corrupting that body, and employing it in the great social revolution which it was designed to precipitate. The second congress took place at Lausanne, Sept. 2, 1867; the third at Brussels, Sept. 6, 1868; the fourth at Basle, Sept. 6, 1869, and at this gathering, attended by 80 delegates, a Mr. Cameron, sent by the national labor union of the United States, claimed to represent 800,000 workmen in the new world. In the following year, 1870, much uneasiness had begun to be felt in Europe in regard to the growing power of the International, and suits were instituted against it in France. Yet a fifth congress was to have been held in Paris in that year, but was prevented by the outbreak of the war. Incidentally, it should be noted that one of the delegates to the congress of Basle was Bakunin, a professed Russian nihilist. Twenty-nine journals advocated the principles of the International in Europe. Seven of these were published in Switzerland and Belgium, one in Italy, six in Spain, and the remainder in Germany and Holland, none being issued on French territory: one, printed in German, emanated from New York. It is believed that efforts were made on the part of the French empire to unite with the Internationals as against the *bourgeoisie*. Certain it is that Mazzini, Garibaldi, Blanqui, and Ledru-Rollin distrusted the new organization. But in the end the empire and the Internationals were found opposed to each other, and though the government decided finally not to attack the International as a secret society, it instituted proceedings against fifteen members of the committee of the Paris bureau, on the charge of having belonged to an unauthorized society, and these were tried early in 1868, but on being condemned, were simply fined 100 francs each. The tribunal in this case declared the association dissolved, in its bureau in Paris; yet a few months later others of its committeemen were tried, condemned, and this time imprisoned for three months, in addition to being fined. The result of these trials was dissimulation on the part of the Internationals—and the institution still lived. In 1869 there came to the surface, in connection with the International, gen. Cluseret, who had been naturalized as an American citizen, and who now undertook to found in this country a journal in the interest of the order: this intention he afterwards abandoned, but claimed to have organized relations between the French and American groups. Documents discovered in the possession of members of the International tended to show the existence of a plot to promote a social revolution in Paris in the interest of the *ouvriers*, and this was, in fact, the inception of the *commune*. The names of certain of these members, who were afterwards tried on account of their membership, and escaped with light fines, appeared later among the list of the members of the *commune*, who, for two months and a half, led the concerted movement of pillage, murder, and incendiarism in the city of Paris. At the present writing there exists no evidence to show that the International has been entirely abandoned.

INTEROCEANIC SHIP CANAL. One of the greatest schemes to facilitate the commerce of the world is the project for the construction of a ship canal across the isthmus joining North and South America—a scheme which has been contemplated since an early period in the history of America. In the search for a shorter route to India, Columbus discovered land which he thought part of Asia, but the explorations of Balboa disproved this and re-presented the old problem. The isthmus was an obstacle which enterprising men thought to remove by cutting a canal. In 1528 Galvao, a Spaniard, proposed to Charles V. an artificial water-way, and the latter, in 1534, directed Cortez to locate a route, and surveys were subsequently made. Gomara suggested three routes in 1551, one via Nicaragua; and another Spaniard explored the isthmus in 1567 under the patronage of Philip II. In 1695 William Paterson projected with royal favor an expedition to colonize Darien and cut a canal across the isthmus, but the enterprise failed. A number of explorations and plans were made after this by men of different nationalities, and, in 1804, Humboldt published a discussion of the various canal routes which aroused new interest; and, as commerce increased, the importance of the problem became still more evident, and many projectors arose in the chief maritime nations.

In 1825 the Central American republic sought the co-operation of the United States in the construction of a canal via Nicaragua, and a contract was made, but the necessary capital was not subscribed. The scheme was resuscitated in 1831. Many persons have recently cited the Monroe doctrine as a reason why the canal should not be built by foreign capitalists, an objection which, in the light of the enactments of both houses of congress in 1835 and '39, constitutes a grave misapplication of the spirit of that doctrine. The more cosmopolitan views, together with liberal legislation and the Clayton-Bulwer treaty with Great Britain in 1850, favor, first, the construction of the canal by any individuals or companies willing to undertake it; secondly, the contemplation of the work as international in character; thirdly, the formation of treaties with other nations which would guarantee the perpetual neutrality of the canal. Since 1864 every part of the isthmus which appeared feasible as the route of a canal with or without locks has been explored by Americans at public or private expense, while in a number of cases all the requisite data have been collected for the estimation of length, excavations in earth and rock, tunneling, location of locks and dams, and the improvement of harbors. After a number of explorations of the isthmus by French engineers, M. Ferdinand de Lesseps, the projector of the Suez Canal, and M. Henry Bloume sent invitations to chambers of commerce and scientific societies, requesting them to send representatives to a congress to be held in Paris to discuss the various projects for piercing the isthmus, which had been elaborated by American and French engineers. It was hoped that by these means the best route might be decided upon, and that then capital would be invested and the work vigorously prosecuted. One hundred and thirty-five engineers, statisticians, and scientists met at Paris, May 15, 1879, and formed the congress, of which M. de Lesseps was chosen president.

A short sketch will first be given of the work of the congress and the projects presented, after which a few observations will be made upon the results. Five committees were appointed:—I. The committee upon statistics, to consider the probable traffic of the canal, the tonnage, etc. In the opinion of these gentlemen a canal without locks would be profitable, while a canal with locks would not. At \$3 per ton, a minimum annual traffic of 6,000,000 tons would be necessary—equivalent to 8 ships of 2,050 tons daily—to pay ordinary dividends. They stated the probable maximum limit of the actual traffic to be 24 ships in one day, but thought a capacity of 50 ships per day desirable; 4,830,000 tons would naturally have passed through the canal in 1876, had it been built. It was calculated that the canal could be finished in 1887, and that the tonnage would aggregate 7,250,000 tons the first year. II. The committee upon economical and commercial questions considered the saving to each country in cost of transportation, the new markets which would be opened, and similar questions. The distance by water from European ports to all the ports of the Pacific ocean, from the cities on the Atlantic coasts to the cities on the Pacific coasts of America and to the vast countries on the coasts of Asia, eastern Africa, and the islands of the Pacific, would be extraordinarily shortened. It would no longer be necessary for the guano and niter of South America and the wheat of California to delay in the calms of the equinox, or to brave the storms of Cape Horn. The great vegetable and mineral resources of the Pacific South American states and of Central America would naturally be greatly developed. The larger part of the tonnage would be that of ships of the United States. III. The committee upon navigation discussed the effect of the canal upon naval architecture, the effect of currents of wind and water upon traffic and the canal, and cognate topics. They recommended that the canal should have a minimum depth of 27.2 ft., a breadth at the bottom of 82 ft., at the top of 229.6 ft., and in rock excavations a breadth at the surface of 98.4 feet. Locks should be 72.2 ft. wide and 492 ft. long, and so distributed that 50 vessels per day could pass. IV. The committee upon technical questions examined different routes, estimates of cost of building, working, maintenance, and repairs; they also considered the safety and speed of navigation in the harbors and canal. They recommended the adoption of the tide-water route without locks, extending from the gulf of Simon to the bay of Panama; this is commonly called the Panama route. V.

The committee upon ways and means calculated the cost at \$120,000,000, the gross annual revenue at \$18,000,000, and the total capital required at \$150,000,000. The cost of maintenance was estimated at \$1,200,000 per annum, and a royalty of 5 per cent of the gross earnings would be due the United States of Colombia. All were in favor of the strict neutrality of the canal. At the close of the session a vote was taken upon the report of the technical committee, which was accepted with the following vote: yeas, 75; nays, 8; abstained from voting, 16; absent, 36; total, 135. Eight projects were presented to the technical committee, of which a short description is given. The width of the isthmus in the vicinity of Panama, which is the narrowest part, is 34.17 m. when measured in a straight line. The Panama railroad crosses the Cordilleras through the pass at Culebra, which is 385.4 ft. above the sea-level.

Routes via Panama.—(1.) In the opinion of Lull and Menocal, who surveyed this route in 1875, a sea-level canal would not prove profitable; but they made a project for a lock-canal. Starting from the bay of Colon, the route crosses the Chagres river at Matachin through a high aqueduct, and reaches the summit level at an elevation of 124.6 ft. above the sea. A dam extending between the rocky shores of the Chagres river would supply the canal with nearly 35,000,000 cubic ft. of water per day through a subterranean duct 13,120 ft. long. The canal crosses the Cordilleras through Culebra pass, enters the valley of the Rio Grande river, deflects to the right, and enters the harbor of Panama c. of the terminus of the Panama railroad. A new channel would be made for the Rio Grande river, and a canal to drain its eastern affluents. Thirty-eight curves, some having as short a radius as 2,493 ft., and 25 locks, would be necessary. The total excavation is estimated at 48,397,000 cubic yds., and the cost at \$96,000,000. The length would be 45.45 m., and the time of passage 2.5 days. Menocal considers the Nicaragua route more desirable than this. (2.) Messrs. Wyse and Reclus, accompanied by explorers and engineers, located a route for a sea-level canal, which follows substantially the line of the Panama railroad. It was after M. de Lesseps had been convinced of the feasibility of a tide-level canal at this point that the invitations were sent out which resulted in the Paris congress. Beginning at the town of Colon, or Aspinwall, on the bay of Simon, the canal crosses the marsh of Mindi, curves twice, and reaches the Chagres river, which it intersects several times and follows to Matachin. It then enters the valley of the Obispo, pierces the mountain through a tunnel 25,263 ft. long, occupies the Rio Grande valley, and terminates in the gulf of Panama. The length of this route is 46.6 m., and there are 13 curves. It uses the river beds the whole distance, and would drain the valleys. A lateral canal would be built at Matachin, on account of a fall of 49.3 ft., to conduct the water of the Chagres into the canal; a number of such cuttings are necessitated by the rapids and the heavy rain-falls, which produce destructive floods. The depth of the canal at the eastern extremity is 27.9 ft. below mean tide, and at the western 23.9 ft. below the lowest neap tide. The canal is 65.6 feet wide at the bottom, expanding near the ends to 323 feet. A cross section of the tunnel is 78.7 ft. wide at mean tide, is shaped above the water like a Gothic arch, and ends in a circular arch the highest point of which is 111.5 ft. above the water. To allow vessels to pass each other, the canal will be widened at intervals of about 5.6 miles. No rise of water exceeding 19½ ft. is anticipated. Sudden inundations would be prevented by dams in the upper Chagres valley, forming natural reservoirs from which the flow of water could be regulated to a considerable extent. A sea-wall 2,788 ft. long would render the bay of Simon serviceable, while a channel at the western end would be protected by walls, the material for which would be obtained by the rock-cuttings. The earth near the ends can be removed by dredging. It was calculated that it would be necessary to excavate 26,625,000 cubic yards of rock and 25,296,000 cubic yards of earth. Wyse and Reclus estimate the cost at \$95,000,000. (3.) A project for a lock-canal, presented by the same engineers, contemplated the construction of dams in the Chagres and Rio Grande rivers, forming two lakes, connected by a cutting, whose maximum depth would be 236.2 feet. This would form a plane 78.7 ft. above tide-water, 25.48 m. long, 13.66 m. from Colon, and 7.45 m. from Panama, to each of which ports the descent would be made through five locks. The calculated cost is \$85,600,000; the total excavation, 15,696,000 cubic yds.; the length, 45.36 m.; and the time of passage, 2 days.

Routes via Nicaragua.—Two projects were presented. (4.) The first was elaborated by Messrs. Lull and Menocal, and based upon surveys made in 1872-73 at the expense of the U. S. government. This plan was favored by the American representatives and by a number of French engineers, and is the route most popular among the American people. The eastern extremity is at the harbor of Greytown, and the western at the harbor of Brito. Starting from Greytown, the canal is constructed, partly by excavation and partly by dikes, on the left bank of the San Juan river to the mouth of the San Carlos, a distance of 43.5 miles. Here a dam is thrown across the San Juan, which flows through a rocky valley, producing slack-water navigation 63.38 m. to the lake of Nicaragua. This lake, situated 107 ft. above the sea-level, having a length of 109.35 m. and a breadth of 34.78 m., forms a large natural reservoir. From 50 to 60 m. of the route will be across the lake; some dredging, however, will be necessary. The western section starts from the lake near the mouth of the Rio del Medio, enters the Rio Grande river 4.97 m. from the lake, where it receives the waters of the Rio del Medio, and

crosses the Rivas pass. At this point a stream called the Chicolata becomes an affluent, and finally the canal enters the valley of the Rio Grande river, and terminates near its mouth. The total length is 180 m., of which but 62 m. are artificial. A bar of sand would be removed from the mouth of the harbor at Greytown, and the deposition of silt prevented by turning the San Juan river into the Colorado. At the harbor of Brito a breakwater would be built, and a jetty to keep out the silt from the Rio Grande river. Ten locks will be required each side of the lake. The western section passes through volcanic mountains, but no great difficulty in construction is anticipated. Blasting will be necessary to form a channel at the entrance of the canal to the lake and in the Rivas pass. The dimensions proposed are: depth, 26½ ft.; breadth at bottom, 71.2 ft.; breadth at water-level, 150.9 ft.; and, in rock, 59.7 ft. at the bottom, and 89.9 ft. at the water-level. The total material excavated by blasting, dredging, and digging amounts to 62,700,000 cubic yds., and the total cost is calculated to be \$52,577,718, or, adding 25 per cent to cover errors and contingencies, \$65,722,147. Time required for transit, 4½ days. (5.) The second project, that of M. Blanchet, is quite different from the American. The chief feature is to preserve the level of the lake throughout the major part of the San Juan river by the construction of a dam. To build the western section, he proposed to cut Guycoyal pass, and convert the valley of the Rio Grande river into a lake by a dam at La Flor 1312 ft. long, and supporting 65.6 ft. of water. The descent to the harbor of Brito would be made by locks. The chain of two artificial lakes and one natural would have a length of 147.26 m., while the total length of the canal would be 182.4 miles. This route requires the excavation of 36,240,000 cubic yds. of earth and rock, the cost is calculated at \$72,400,000, the time at 4½ days, and 14 locks must be built.

(6) *The Tehuantepec route*, submitted by M. de Garay, is located in Mexican territory, and connects the bay of Vera Cruz with the gulf of Tehuantepec. The land is level and low, except a narrow ridge of the Cordilleras on the Pacific coast. The water from a number of large streams would be utilized. The dimensions proposed would not admit of the passage of the largest ships. The length would be 174 m.; the time of passage, 12 days. One hundred and twenty locks would be necessary. (7) *The Atrato-Napipi route*, surveyed by Selfridge and Collins, starts from the gulf of Darien and passes up the Atrato river at its level to the mouth of the Napipi, a distance of 149 miles. The minimum depth of the river is 25.6 feet. From this point the air-line distance to the bay of Chiri Chiri is 27.95 miles. Dredging would be done for 5.6 m. in the Napipi river, under which the canal afterwards passes by means of a tunnel; it terminates in a basin 18.7 ft. above mean tide after passing through 5.6 m. of tunnel in the mountains near the Pacific. Two locks connect the basin with the bay of Chiri-Chiri, and jetties must be built and bars cut through in the harbors. The cost is estimated at \$98,200,000, the time of passage at three days, and the total length at 180 miles. (8) *The San Blas route* was explored by McDougal in 1864, at the expense of Mr. Kelley, of Philadelphia, and was afterwards surveyed by Selfridge. At this point, the narrowest part of the isthmus, the width is but 31 miles. A tide-level canal is impracticable, owing to the height of the Cordilleras and the location of the streams. Upon the authority of Wyse and Reclus, the length of the canal would be 32.9 m., and about 10 out of the 24.85 m. of excavation would be tunneling. An excavation of 44,473,000 cubic yds. would be required, at a cost of \$95,000,000, while the passage would take one day, and there would be one sea-lock. In addition to the plans outlined above, which were the more important ones presented to the congress, a number of modifications of them, as well as independent routes, have been proposed. In a paper read before the society of arts, London, capt. Bedford Pim, R.N., M.P.—a gentleman who has passed through Nicaragua six times, and surveyed the major part of both coast-lines of the isthmus—pronounces the improvement of the harbor at Greytown the most difficult part of the work on the Nicaragua route. The entrance to the harbor is alternately choked up with sand by a storm, and opened by a flood in the San Juan river. To avoid this harbor, which he thinks would "completely swamp the enterprise," he proposes a route starting from Pim's bay, 40 m. n. of Greytown, and ending at the port of Realejo, on the Pacific. This route would be 290 m. long, and would include 85 m. of navigation on the lake of Nicaragua and 40 m. on lake Managua. The chief feature of the plan is the proposal to make the depth of the canal only 8 ft., and to transport the vessels upon "pontoons by the process which has been successfully used in the Victoria docks (London) for years." He suggests that a railroad should first be built connecting with steamboats on the lakes as an auxiliary to the construction, and as liable to afford a valuable knowledge of the district. The captain estimates the cost at an average of about \$100,000 per mile, or a total of \$30,000,000, and proposes that the governments of England, France, and the United States should each guarantee one per cent upon the capital, and that a five-acre plot of land should be given with each \$50 share.

Speaking of the *personnel* of the congress, a gentleman well known in Paris wrote: "Let it be remembered that one-half of the congress were French; they had been chosen by the organizers of that assembly; 34 members belonged to the geographical or the commercial geographical society of Paris. What was their competency to decide between a canal with locks or on a sea-level? Fourteen other members were engineers or assistants of some sort on the Suez canal. What was their impartiality between M. do

Lesseps and others? And, among the others, if one takes account of personal friendships and of the prestige exercised by a great name, how many more will remain?" Capt. Pim says, "The selection of a route for the proposed canal seems to have been a foregone conclusion." The parties most interested in the canal are the American states and England. England sent no official representative, but gave sir John Stokes permission to attend. The United States looked upon the congress as a meeting of capable specialists convened to discuss a matter of paramount importance, and, with this in view, appointed rear-admiral Daniel Ammen and Anceito G. Menocal, civil engineer in the U. S. navy, commissioners to represent the government officially, and placed at their disposal all relevant reports and papers which had been prepared by government officers. They had "no official powers or diplomatic functions," and no authority to state what action would be taken by their government. Commissioner Ammen abstained from voting, upon the ground that "only able engineers can form an opinion after careful study of what is actually possible, and what is relatively economical in the construction of a ship canal." At present, whatever may be the opinion of the advocates of other schemes, there appear to be two strong parties: first, those favoring a tide-level canal via Panama; and, second, those favoring the lock canal via Nicaragua, projected by Lull and Menocal. M. de Lesseps says an hour and a half were required for a steamship to pass through a lock which was a "vast improvement" upon older ones; therefore locks would limit the traffic of the the Nicaragua canal, and render it unprofitable. Rear-admiral Ammen states that a lock 515 ft. long, 60 ft. wide, and having a lift of 18 ft., is being built at St. Mary's, Mich., through which, it is computed, a steamer will pass in 11 minutes. M. de Lesseps thinks earthquakes would injure the locks. Admiral Ammen thinks, upon the evidence of ruined archways, that the result would not be serious, while the locks would be so constructed as to allow repairs to be made in the minimum time, and, save in four instances, without drawing the water from the canal. Eminent scientists and engineers have made objections to the Panama route, some of which they consider serious and irremediable. Commodore M. F. Maury, LL.D., author of a work upon physical geography, and Maury's *Sailing Directions*, says: "If nature, by one of her convulsions, should rend the continent of America in twain, and make a channel across the isthmus of Panama or Darien as deep and as wide and as free as the straits of Dover, it would never become a commercial thoroughfare for sailing-vessels." He also states that vessels going to or from Panama have been detained by calms for months at a time. This same great belt of calms covers all of the isthmus s. of Panama, while its effect at the mouth of the Atrato is still more vexatious! The fact that the Panama railroad has not diverted sailing-vessels from their old route around cape Horn, confirms the above. Only one-third of the foreign commerce of England is carried on in steamships, and their increase is less rapid than that of sailing-vessels, so that a large part of the shipping of the world would be excluded. The heavy rainfall of the Chagres valley culminated in a flood in Nov., 1879, which damaged the Panama railroad to such an extent as to cause the suspension of traffic for two or three months. Such a flood would probably have done much injury to the canal had it existed. Panama affords no materials for construction, inferior facilities for obtaining supplies and labor, has a dry season of but two or three months, and is one of the unhealthiest regions in the world. On the other hand, Nicaragua contains good building material, ample supplies, a population from which many laborers could be recruited, and it has a dry season of five or six months. It is far more healthy, especially west of the lake. The Panama route would cost \$94,511,360; the Nicaragua, \$65,722,137; the former would draw little or no support from the region through which it passes, while the latter would develop a country rich in the productions of the three kingdoms of nature. The concession for the Panama route granted by the United States of Colombia is controlled by M. de Lesseps, who organized a company and opened books in Europe and America to receive subscriptions. Some steps have been taken in America to organize the Nicaragua canal company, the presidency of which was offered to gen. U. S. Grant by admiral Ammen. Mr. Joseph Nimmo, chief of the bureau of statistics, thinks the present commerce insufficient to support the canal. Whether this be true or not, the question is one not of desirability nor of feasibility, but one of the time when to build, and of its safety as a financial investment.

INTEROCEANIC SHIP RAILWAY. Capt. James B. Eads, the projector of a railway across the American isthmus for transporting ships, presented the essential features of his plan to the canal committee of the house of representatives in March, 1880. Of its kind, the scheme is in many respects more ambitious than any heretofore proposed. The engineering and financial success achieved by capt. Eads in the construction of the St. Louis bridge, and the jetties at the mouth of the Mississippi river, demands a careful consideration of projects which he may advocate. The proposed railway is to consist of twelve tracks, placed 4 or 5 ft. apart, upon which the ship carriage, or cradle, runs. At each terminus an inland basin is excavated, perpendicular to the shore line of the harbor, and 3,000 ft. long. Gates placed at the outer end of the basin, which is lined with masonry, make it possible to pump out the water when repairs are necessary. The track in the basin is 30 ft. below water-level at the harbor end, and, rising 1 ft. in 100, intersects the surface level at the other extremity. The dimensions of cradles will be adapted to the size of vessel transported. The largest

merchant ships weigh, when loaded, about 6,000 tons. This weight will be distributed over 1200 wheels, making the pressure 5 tons upon a single wheel which could support 20—a pressure ordinarily exceeded in practice, as the driving-wheels of many locomotives must sustain $6\frac{1}{2}$ tons.

A ship to be transported enters the harbor end of the basin, and is floated to where her keel is over the keel-block of the cradle, then the supports are adjusted under the bilges substantially as in a dry dock. The weight rests chiefly upon the keel, while a part is distributed over the bilge blocks, which also keep the ship in an upright position. A stationary engine hauls the cradle and ship out of the water, and then two very powerful locomotives are attached, which draw their great load to the other terminus, at a speed of ten or twelve miles an hour. The locomotives are to have five times the size and power of freight engines, and with their tenders will use all twelve tracks. The wheels have double flanges, and as their number is great, the rails and road-bed sustain but a moderate pressure, and the failure of one or several wheels would not be serious. Derailment is impossible, and the displacement or breakage of rails would cause no delay, as six of them would bear the entire weight. Above each wheel are two strong steel springs, which diminish the strain, and each wheel can be removed separately by loosening two bolts. Cars would pass each other by means of transfer tables, which would move the cradles sideways. One of the chief arguments against this plan is that loaded ships will not endure the strains imposed upon them when out of water, and supported only at intervals. The assumption that the mobility of water equalizes the strain is not correct, as it is common in rough weather for the whole weight of a ship and cargo to bear upon the ends or the middle, leaving the remainder of the ship unsupported; indeed, a gale subjects a ship to very severe torsional and lateral strains, which change constantly in direction and intensity—strains far exceeding any which would be incurred on the railway. Farther evidence upon this point is furnished by the portage railroad of the Alleghany mountains, which, forty years ago, connected the canal systems of eastern and western Pennsylvania. Over this railroad loaded canal-boats—frail craft compared with sea-going vessels—were hauled for a distance of over 30 m. up and down steep inclines. Many experienced ship-builders consider ship transportation by rail feasible, and, compared with ship canals, economical. Thus it will be seen that this project involves only the combination upon a large scale of a number of well-tried engineering expedients.

Routes could probably be located at Panama, Nicaragua, and Tehuantepec, with a grade of 30 or 40 ft. to the mile. Capt. Eads estimates the cost of a road and harbor at Panama at \$50,000,000, and the route is, perhaps, the shortest that could be found, but expensive harbor improvements would be required. The Chiriqui route has steeper grades, but superior natural harbors. The Panama route would probably exclude the transportation of vessels without steam-power. See INTEROCEANIC SHIP CANAL. Mr. Eads believes "that upon any route where it is possible to build a canal, it is equally possible to build and equip a substantial and durable ship railway;" that a railway is practicable where a canal is not; that the elements of cost, time of construction, speed in transit, capacity, and cost of maintenance and operating, are all heavily in favor of the railway; that the capacity of the railway could be increased at any time to transport more or larger ships with no interruption of traffic; that more accurate estimates can be made of the cost of a railway and the time of completion than of a canal, as the latter requires sub-aqueous work, where the conditions are more variable, and that, therefore, capitalists will have more confidence in the railway. It is estimated that the railway could be duplicated once in ten years for the interest on the difference between the cost of a canal and a railway of equal capacity. A traffic of 5,000,000 tons yearly, at \$2 per ton, would give an income of \$10,000,000, which, deducting 50 per cent for expenses, would leave a dividend of 10 per cent upon the capital.

INTERPRETATION, in law, is the judicial exposition of the meaning of constitutions, treaties, statutes, contracts, wills, and other papers, or parts of the same, that affect the rights of parties to any action in a court of justice. It often happens that a suit is determined by the interpretation of written words or phrases of doubtful meaning, so that courts in exercising their powers in this respect incur a very high responsibility, which is all the greater from the impossibility of reducing interpretation to an exact science under rigid rules. It is necessary that courts should not only have a clear understanding of the general meaning of words and of their application to the matters in hand, but also that they should be able impartially to weigh the whole environment of the cases upon which they are to pass an authoritative judgment, and at the same time cherish an earnest purpose to do exact justice to the parties. Their duty sometimes involves the necessity for very nice, not to say ingenious, discriminations, which tax alike their judgment and conscience. In regard to many things their task has been made easy by well settled rules and a long line of precedents; but new questions often arise, upon which precedents are to be made rather than followed. It sometimes happens, from a lack of skill in composition, that a single passage, taken by itself, is partially or wholly incompatible with the manifest spirit and intent of a legal document. In such cases courts will exercise a large discretion, in order, if reasonably possible, to make the instrument consistent in itself. Every written paper necessarily

assumes the existence of facts or incidents that are either not expressed at all, or expressed only by implication, and that must be considered before the exact meaning can be determined. An incompetent or unscrupulous judge might do a great wrong by a too close adherence to a particular part of an instrument while failing to give due weight to its spirit and purpose as a whole. Particular words and phrases must be considered in their relations to the context and to the subject matter, not torn from their connection and interpreted by themselves in such a way as to defeat the manifest intent of the instrument. Oral evidence cannot vary the terms of a written document, which must be considered as a whole. Courts are not at liberty to supply by interpretation the unexpressed intent of a legislature, testator, or contractor. The interpretation must be made in good faith and be in accord with good sense and the common understanding of language, not forced or strained to support a theory fatal to the document itself. Inadvertent errors or omissions will be overlooked, and mistakes in orthography and grammar will be lightly regarded where the meaning is clear. It is a general rule that the words of a statute are to be taken in their ordinary sense; but if the statute relates to a particular subject or class of persons, and requires the use of terms not generally familiar, their meaning will be determined by the prevailing usage in regard to the subject. The will of a legislature cannot be judicially conjectured. Penal statutes, in deference to the recognized rights of accused persons, are construed with great strictness; courts will not enlarge their scope by strained interpretations even to punish persons of whose guilt they have no moral doubt.

INTRANSIGENTES, the name of a political party in Spain, comprising the extreme radical republicans. The federal republic having been declared June 8, 1873, they combined with the internationalists in a communistic movement, which broke out in insurrection in several cities at once. Cartagena was held by them from July, 1873, until Jan., 1874, when it was surrendered. These troubles brought about the restoration of Serrano to the executive government, and led up to the proclamation of Alfonso XII. as king of Spain.

INTRENCHMENT (*ante*). See **FORTIFICATION**, *ante*.

INUNDATIONS AND FLOODS are produced by the overflow of the ocean or of rivers. To these the low countries adjacent to the sea or rivers are liable. Holland, many of whose cities and fields are upon ground snatched from the ocean, presents the most frequent scene of these calamities. In the year 860 A.D., the sea rose and swept over a portion of the Netherlands, carrying with it vast tracts of land, and changing the very shape of the coast. In 1014 a large part of the Netherlands and England, and in 1134 a part of Flanders, were submerged. In 1164 a part of Friesland and the lowlands of the Elbe and Weser were inundated. On All Saints' day in 1170 the northern part of Holland was visited with a flood so terrific that miles of country were swallowed up by the encroaching sea, and exactly to a day 400 years later the south of Holland was ravaged by the waves, so that Antwerp, Bruges, Hamburg, Rotterdam, and Amsterdam were submerged, and 30,000 people perished. In 1277 an inundation from the sea destroyed 44 villages; in 1287 by another 80,000 persons were drowned, and the Zuyder Zee received its present form and extent. In the 15th c. it is said that 100,000 were destroyed through the imperfection of dikes. In 1362 a flood destroyed 30 villages on the coast of Nordstrand. The St. Elizabeth flood of 1377 swept away 72 villages, laid desolate 50 m. of territory, and altered the course of both the Maas and Rhine. By the formation of dunes and an elaborate system of dikes the Dutch have succeeded of late years in keeping the restless invader at bay, and thus avoiding a national calamity. But while the dunes have done much to save the Netherlands from great loss, yet these would have afforded but a partial barrier without dikes. When dikes were first used is not known. In the 7th c. Friesland was diked by king Adgillus, and in the 8th c. Zealand by the Danes and Goths. When Spain ruled Holland, the dikes, not being kept in good condition, the engineer Caspar de Robles, governor of Friesland, compelled the people to repair them, and set his own soldiers to work.

Other countries besides Holland have suffered from the encroachments of the ocean. England, notwithstanding her barrier of high cliffs, has been the victim of several inundations. In 1607 the greater part of south Devonshire and the neighboring countries of Dorset and Cornwall were deluged by a sea-flood that caused a fearful loss of life and property. Denmark too, in 1634, was visited with an inundation, when the sea with a mighty sweep which reached even Bremen, Hamburg, and Oldenburg, poured over the villages of the Nordland, destroying more than 20,000 human beings and 150,000 cattle. In 1717 the waters overflowed the northern coast, and ruined an immense number of buildings. In 1825 the waters rose to a great height, the flood being ascribed to an earthquake.

The floods from rivers are sometimes beneficial, as, for instance, those of the Nile, which fertilize with their deposit the alluvial plains. But for the most part they are destructive, and those of modern times have been more disastrous than earlier ones. The direct cause of river-floods is the discharge of water into the channels more rapidly than it is carried off. The most effectual remedy against these disasters is high and solid dikes, though even these are sometimes unavailing. In 1829 an inundation occurred at Dantzic, occasioned by the Vistula breaking through its dikes, when 4,000

houses were destroyed, many lives lost, and 10,000 cattle perished. In France, Oct. 31 to Nov. 4, the Saone poured its waters into the Rhone, broke through its banks, covered 60,000 acres, and inundated several cities and towns. The Saone had not risen so high for 238 years. May 12, 1849, there was an inundation of the Mississippi at New Orleans, when 160 squares and 1600 houses were flooded. At different times the inundations of the Ohio, Mississippi, and other rivers have destroyed much property and many lives. The most destructive inundation of modern times is that which occurred in Hungary, March 12, 1879. Szegedin, the second commercial town in Hungary, was nearly destroyed by the bursting of the dikes of the river Theiss. The first intimation of the coming calamity was given Monday, March 10, when two of the three dams protecting the town gave way, and Dorozsma near Szegedin, containing 400 houses, was totally destroyed. Though 5,000 men were immediately set to work on the remaining embankment, two days later it burst, and the waters, aided by a gale, rushed forth with terrific violence, carrying away part of the railway station and rolling-stock, and flooding the town with many feet of water. Two-thirds of the town were submerged, including the citadel, the post and telegraph offices; and whole rows of houses fell. The synagogue fell in, crushing many who had sought refuge in it, and the inmates of the orphanage were buried in its ruins. Two manufactories were burned. To add to the horrors of the scene the city was in darkness, the gas-works being 15 ft. in the water; 80,000 people were houseless, and from 4,000 to 6,000 supposed to have been drowned. Of 9,700 houses all but 261 were destroyed. A hundred square miles in the neighborhood of Szegedin were flooded and the crops of the district lost. So sudden and violent was the flood that, instead of five or six hours which it was calculated the flood would take to spread through the town, scarcely an hour and a half had passed before Szegedin was submerged. The poorer classes were extremely unwilling to leave their homes, and in many cases force was necessary for their removal. Thousands suffered for want of food, and sickness broke out among the refugees encamped on the dikes.

INVERNESS, a co. of Cape Breton island, Nova Scotia, Canada; pop. '71, 23,415; soil fertile. Coal and petroleum are found. Fishing and agriculture are the chief occupations of the people. Capital, Port Hood.

INVERTEBRATE ANIMALS (*ante*). The following synopsis is a general classification, according to the latest and best authorities, of the principal divisions of the invertebrate branch of the animal kingdom, including classes, orders, and most of the families. It will serve, also, as a reference or index to the various articles scattered throughout the work, which specially treat of genera and species. The etymology of the principal names is usually given except when found in the articles referred to.

SUB-KINGDOM I. PROTOZOA, first or lowest animals; very simple, mostly microscopic; body composed of a jelly-like, albuminous substance, having no nervous, and no distinct circulatory, system; usually no mouth and no special digestive cavity. See PROTOZOA.

CLASS A. GREGARINIDA (Lat. *gregarius*, living together in numbers). Very minute organisms inhabiting the interior of insects and other animals. They have no power to throw out prolongations as in rhizopoda. This class has only one order. See GREGARINÆ.

CLASS B. RHIZOPODA (q. v.). Protozoa having the power of throwing out and retracting prolongations (pseudopodia) of the body substance; no mouth, with few exceptions. Divided into five orders:

Order I. *Monera* (Gr. *monas*, unit). Minute organisms having the power of throwing out thread-like prolongations, which are a part of the structureless body (*sarcodæ*). These pseudopodia branch out in all directions, interlacing and anastomosing. When at rest the body is more or less globular. There is no nucleus or contractile vesicle.

Order II. *Amœba* (Gr. *amœbos*, changing). Rhizopods which are usually naked, having short, blunt pseudopodia which do not anastomose. They contain a nucleus and one or more contractile vesicles. The amœba or proteus animalcule is the type of the order. It is a microscopic animal, which makes its appearance in vegetable fresh-water infusions. It is composed of two layers of gelatinous matter, called the entosarc and the endosarc, or outer and inner layers. The endosarc contains the nucleus and contractile vesicle or vesicles, and also cavities called vacuoles. There are no traces of any nervous system in the amœba, and yet it possesses locomotive power.

Order III. *Foraminifera* (Lat. *foramen*, an aperture). Rhizopods in which the body is protected by a shell or *test*, usually composed of carbonate of lime. Body not divided into entosarc and endosarc, as in amœba; and there is neither nucleus nor contractile vesicle. Pseudopodia long, thread-like, and interlacing. The foraminifera are mostly marine. Dr. Carpenter says that foraminiferous fauna probably have a greater modern range of seas than at any previous period, but there is no indication of any tendency to elevation to a higher type. There are vast deposits of them in the deeper portions of the Atlantic ocean, where the water is warmed by heated currents. There are several genera and species, many of them presenting rarely beautiful forms. Foraminifera have been found in paleozoic and mesozoic formations, and the *eozoön Canadense*, found in the Laurentian rocks of Canada, has been thought to be a gigantic foraminifer. See FORAMINIFERA.

Order IV. Radiolaria (Lat. *radius*). Rhizopods having a siliceous shell or test, or siliceous spicules, and pseudopodia standing out like radiating filaments, sometimes interlacing. There are three families.

Family 1. Acanthometrina, minute globular bodies, surrounded by siliceous, radiating spines, often floating near the surface of the ocean, sometimes in great numbers.

Family 2. Polyastina. Nearly related to foraminifera, the principal difference being that the shells are flinty instead of calcareous. The siliceous shell is sometimes exceedingly beautiful. They are all microscopic, and have a wide distribution in the ocean. They are also abundant tertiary fossils.

Family 3. Thalassicolliida (Gr. *thalassa*, sea, and *kolla*, glue). Rhizopods having "structureless cysts containing cellular elements and sarcode, and surrounded by a layer of sarcode, giving off pseudopodia, which commonly stand out like rays, but sometimes have the form of a network" (Huxley). They are simple, or composite. The three best known genera of the family are *sphaerozoum*, *collosphara*, and *thalassicollella*. They abound in most seas, floating near the surface; size, from an inch in diameter downwards.

Order V. Spongida or Porifera (q.v.). "Sarcod bodies destitute of a mouth, and united into a composite mass which is traversed by canals opening on the surface, and is almost always supported by a frame-work of horny fibers, or of siliceous or calcareous spicula" (Allman). See SPONGE.

CLASS C. INFUSORIA (Lat. *infusum*, an infusion). Protozoa usually provided with a mouth and rudimentary stomach. They have vibrating cilia or contractile filaments, but no pseudopodia; bodies microscopic, usually consisting of three layers; occur in infusions. Divided into three orders:

Order I. Ciliata (Lat. *cilium*, an eyelash). Infusoria in which the outer layer of the body has more or less vibratile cilia, or hair-like organs, for locomotion or procuring food. Some are provided also with jointed bristles; others have hooks for attaching themselves to other bodies. The typical members of the order are *paramœcium* and *vorticella* (q.v.). See INFUSORIA.

Order II. Suctorina. Infusoria in which the body is covered with a number of radiating, retractile, filamentous tubes, having at their extremities suctorial disks, by means of which they obtain food.

Order III. Flagellata. Infusoria having lash-like filaments (flagella) and occasionally cilia. Some have one and some two flagella, and some are composed of numerous zooids, each with a single flagellum and projecting membranous collar, all contained in a slimy sarcod, and forming a cylindrical colony.

SUB-KINGDOM II. CœLENERATA (q.v.). This sub-kingdom is the modern representative of the Radiata of Cuvier, with the following exceptions: The echinodermata and solecidæ have been removed to form annuloidæ; all of protozoa, to form that sub-kingdom; and polyzoa have been placed with mollusca. The remainder of radiata constitute cœlenterata, a name proposed by Frey and Leuckhart, from Gr. *koilos*, hollow, and *enteron*, the bowel. The principal feature of this sub-kingdom is the peculiar structure of the digestive apparatus; the body cavity and the stomach being one and the same. In some of the cœlenterata, however, there is a wide membranous tube leading from the mouth into the general interior cavity. This sub-kingdom is divided into two classes, hydrozoa and actinozoa. See POLYPI.

CLASS A. HYDROZOA (Gr. *hudra* and *zoön*, animal; hydra animal). Cœlenterata in which the walls of the digestive cavity entirely coincide with those of the body cavity. The reproductive organs are external processes of the body. They are all aquatic, mostly marine. The hydrozoa are divided into six sub-classes:

SUB-CLASS I. HYDROIDA. See HYDROIDS. This sub-class comprises six orders:

Order I. Hydridæ. Fresh-water polyp; only one genus, *hydra*, including various species.

Order II. Corynida (Gr. *korune*, a club). Pipe coralline (q.v.), (tubularia). The order is entirely marine, with one exception. The reproductive elements are developed in distinct buds or sacs, which are external processes of the body, called by professor Allman, *gonosporophores*. There are great variations in the form of these generative buds. In some species they are mere sac-protuberances called sporosacs. There is an advance in structure in the different genera, the gonosporophore being sometimes composed of a bell-shaped disk, called the gonocalyx.

Order III. Sertularida (Lat. *sertum*, a wreath). The animals of this order resemble the corynida in becoming permanently fixed after their embryonic condition. Each polypite consists of a soft, contractile and extensible body, having at its distal extremity a mouth surrounded by prehensile tentacles. The internal arrangement of the whole organism is exceedingly interesting. See SERTULARIA, PLUMULARIA, and POLYPI.

Order IV. Campanularida (Lat. *campanula*, a bell). This order resembles sertularida, but the gonosporophores are usually detached as free-swimming medusæ, instead of being permanently attached.

Order V. Thecomedusæ. Prof. Allman has recently described a remarkable hydrozoön which he regards as the type of a new order. It is always found embedded in a species of sponge, which it permeates by chitinous (see CHITIN) tubes, opening on the surface. See STEPHANOSCYPHUS MIRABILIS.

Order VI. Medusida or *Hydromedusida* (acalephæ in part). The animals included in this order have often been placed in a distinct sub-class (discophora) of hydrozoa, but they are now generally regarded as simply an order of hydroid zoöphytes. They comprise most of the smaller organisms commonly known as jelly-fishes or sea-nettles, from the property of causing a stinging to any part of the human body which may be touched by them. See *ACALEPHÆ*.

SUB-CLASS II. SIPHONOPHORA (Gr. *siphon* and *phero*, I carry. All of this sub-class are permanently free, and composite. They are very beautiful, delicate organisms, chiefly inhabiting the surface of tropical seas. There are two orders:

Order I. Calycophoridae (Gr. *kalys*, a cup, and *phero*, I carry). The bodies of the polypites in this order are distinctly divided into three portions, called proximal, median, and distal. The proximal ends are provided with protecting plates called bracts. The calycophoridae have swimming bells by which they propel themselves through the water. Huxley divides this order into four families: diphydæ, sphæronectidæ, prayidæ, and hippopodidæ.

Order II. Physophoridae (Gr. *physa*, an air-bladder). The polypites of this order resemble those of the preceding in form, but the tentacles are more complicated, and are sometimes several inches in length. They also have peculiar bodies, called feelers, or pulpi, which resemble immature polypites. The reproductive organs are developed upon special processes, called gonoblastidia, which sometimes remain permanently attached, or are thrown off as free-swimming medusoids. The genus *physalia* is the Portuguese man-of-war. See *PHYSALIA*. The order is divided into several families by Huxley.

SUB-CLASS III. LUCERNARIDA (Lat. *lucerna*, a lamp). These are the sea-blubbers, sea-jellies, hidden-eyed meduse. Divided into three orders:

Order I. Lucernaridæ. This order comprises those lucernarida which have only a single polypite, and are fixed, but only for a time. Reproductive elements developed in the walls of the umbrella, without the intervention of free zooids.

Order II. Pelagidæ (Gr. *pelagos*, sea). These animals, like the preceding, have only a single polypite, but have an umbrella with marginal tentacles in which are developed the reproductive elements.

Order III. Rhizostomidæ (root-mouthed lucernaridæ). In this order the reproductive elements are developed in free zooids, produced by fission from attached lucernaroids. The umbrella of generative zooids is without marginal tentacles, and the polypites are numerous, forming with the genitalia a dendriform mass depending from the umbrella (Greene). See *RHIZOSTOMIDÆ* and *ACALEPHÆ*.

SUB-CLASS IV. GRAPTOLITIDÆ (Gr. *graphe*, I write). Rhabdophora of Allman. The members of this sub-class are all extinct, but their nearest living allies are the scutularians. Their structure is not easily made out. They are generally found in pyritous impressions, having a silvery luster, in the Silurian formations, and are characteristic fossils. See *GRAPTOLITES* and *SERTULARIA*.

SUB-CLASS V. HYDROCORALLINÆ. This sub-class has been formed by Mr. Moseley for the reception of two groups of marine animals which produce a regular skeleton of carbonate of lime, often of large size, and which have been hitherto generally referred to the corals. See *MILLEPORE* and *STYLASTERIDÆ*.

CLASS B. ACTINOZOA (Gr. *actin*, a ray). Cœlenterata, in which the imperfect stomach, or wide tube, which is so called, empties into the body cavity, which latter is divided into a number of compartments by vertical partitions. The reproductive organs are internal. As in hydrozoa, the tissues are chiefly divided into two layers, an ectoderm and an endoderm, but there is more tendency to the formation of special organs, and in some of the members of the class muscular fibers are well developed. No vascular system has been found in any of the actinozoa, nor any traces of a nervous system except in ctenophora. Most of the actinozoa are permanently fixed. Sea-anemones have some locomotive power, and one order, ctenophora, above mentioned, consists of active, free-swimming organisms. Many of the class secrete a horny or calcareous skeleton called a *coral*, or *corallum*. The actinozoa are divided into four orders:

Order I. Zoantharia (Gr. *zoön*, animal, and *anthos*, a flower). In this order the soft parts are disposed in multiples of five or six, typically six, and they also have simple tentacles, usually numerous. The zoantharia are divided into three sub orders:

Sub-order I. Zoantharia malacodermata. In these organisms there is either no corallum or a pseudocorallum in the form of adventitious spicules scattered through the soft parts. This sub-order comprises three families:

Family 1. Actinidæ. These are commonly known as sea-anemones. They have no corallum or only a pseudocorallum, and are seldom compound. They have locomotive power.

Family 2. Illyanthidæ. No corallum; polyps single and free, with rounded tapering base. The genus *illyanthus* is in most respects identical with the ordinary *actinae*, but the base of its conical body is much attenuated, and by separating allows of a free existence.

Family 3. Zoanthidæ. These organisms are in colonies, and exist in the form of a crust or of creeping roots, and have no power of locomotion.

Sub-order II. Zoantharia sclerobasica. These are the black corals, and are always

composite, composed of a number of polypes united by a common, fleshy material, which is thin and internally supported by a simple or branched horny axis called a *sclerobase*. The polypes do not secrete a calcareous, but a horny corallum, and they generally have six simple tentacles. All the black corals form colonies, which are fixed to some foreign object.

Sub-order III. Zoantharia, Sclerodermata, or Madreporida. The animals comprising this sub-order include most of the coral-producing zoöphytes of recent seas. See ZOANTHARIA.

Order II. Alcyonaria. The asteroid polyps. Tentacles fringed; soft parts arranged in multiples of four instead of five or six, as in zoantharia. All the members of this order are composite, the whole colony forming a branched mass, with the exception of one genus, *haimenia*. Divided into five families: 1. alcyonidae; 2. tubiporidae; 3. pennatulidae; 4. gorgonidae; and 5. helioporidae; the fifth family being recently founded by Mr. Moseley. The alconyum, or "dead-men's toes," may be regarded as the type of the family alcyonidae. The tubiporidae contain the organ-pipe corals, the corallum being composed of bright scarlet cylinders united by plates. See CORAL, POLYPI, GORGONIA, ALCYONIUM, and PENNATULA.

Order III. Rugosa (Lat. *rugosus*, wrinkled). This order is extinct, and, excepting *holocystis elegans* of the cretaceous formation, their fossils do not occur in rocks later than the paleozoic, and therefore are known only by the characteristics of the corallum. The rugosa are divided into four families: 1. stauridae; 2. cyathaxonidae; 3. cyathophyllidae; 4. cystiphyllidae.

Order IV. Ctenophora (Gr. *kteis*, a comb, and *phero*, I carry). "Transparent, oceanic, gelatinous actinozoa, swimming by means of *ctenophores*, or parallel rows of cilia disposed in comb-like plates" (Greene). The order comprises five families: 1. calymnidae; 2. cestidae; 3. callianiridae; 4. pleurobrachiidae; 5. beroidae. See BERÖE. The cestidae have a flat, ribbon-shaped body at right angles to the direction of the digestive tract, and three or four feet long (Venus's girdle). The pleurobrachiidae, the typical family, have a transparent, colorless, spherical, melon-shaped body, in which the two poles of the spheroid are called *oral* and *apical*, the rest of the body constituting the interpolar region. There is a transverse mouth at the oral pole opening into a fusiform digestive cavity, in the lower part of which there are peculiar brown cells performing, it is supposed, the functions of a liver. The interpolar region, or body, is traversed by eight meridional bands or *ctenophores*, elevated transversely into a number of ridges, each having a fringe of cilia, forming a comb-like plate. Besides these comb-like ridges, there are two long, tentacular processes, also fringed with curved cilia, forming singularly beautiful and interesting organs. See CTENOPHORE.

Sub-kingdom III. Echinodermata (Gr. *echinos*, hedgehog, and *derma*, skin; from having a spiny skin). The echinodermata, including the sea-urchins, star-fishes, etc., were formerly included in the sub-kingdom radiata, but they form a very distinct group, and although they have been classified by prof. Huxley, on account of some remarkable affinities with the lower worms, as the tape-worm and other intestinal parasites, in a sub-kingdom called annuloida, the weight of authority inclines to a separation into a distinct group, constituting a sub-kingdom. The echinodermata may be defined as follows: Simple marine organisms, the body of the adult more or less conspicuously radiate, that of the young often distinctly bilateral. Nervous system radiate, composed of an æsophageal ring and radiating branches. Sexes generally distinct, rarely united. They are commonly known as sea-urchins, star-fishes, brittle stars, feather-stars, sea-lilies, sea-cucumbers, etc. The echinodermata are divided into seven orders:

Order I. Crinoidea (Gr. *crinon*, a lily, and *eidos*, form). Sea-lilies; feather-star (q.v.); medusa-head crinoid; pentacrinus (q.v.); stone-lily—*encrinus liliiformis*. See EXCRINITES and CRINOIDEA.

Order II. Blastoida (Gr. *blastos*, a bud, and *eidos*, form). These animals are all extinct, and their fossils are found in the paleozoic formations, chiefly in the carboniferous rocks. The body was fixed to the sea-bottom by a short, jointed pedicel, and in many respects resembled the following.

Order III. Cystoida (Gr. *kystis*, a bladder). These organisms are also extinct, and their fossils are confined to the paleozoic age. The body was, in most instances, fixed to the sea-bottom by a short, jointed, calcareous pedicel, and was more or less spherical and covered with numerous polygonal, calcareous plates accurately fitted together. On the upper surface there were two, and sometimes three, apertures, the use of which is a matter of controversy. One was, probably, for the mouth, one for locomotion, and the third for voiding excreta.

Order IV. Ophiuroidea (Gr. *ophis*, a snake; *oura*, a tail; and *eidos*, form). Sand stars—*ophiuria*; brittle stars—*ophiocomma*.

Order V. Asteroidea (star-formed). Star-fishes (q.v.); cross-fish—*uraster*; sun-star—*solaster*; cushion-star—*goniaster*.

Order VI. Echinoidea, sea-urchins, sea-eggs, heart-urchins. Sexes distinct. See ECHINUS.

Order VII. Holothuroidea, vermiform or slug-like echinoderms, with a leathery skin, in which calcareous granules and spicules are developed; mouth surrounded by a circle of tentacles; larva vermiform, and without a skeleton; sexes usually distinct. The

members of this order are commonly known as trepangs, sea-cucumbers, etc., and are the most highly organized of all the echinodermata. There is a long, convoluted intestine, and a special respiratory or water-vascular system is often developed in the form of arborescent tubes. At a certain period the young are barrel-shaped, having transverse rings of cilia, by means of which they rotate rapidly on their long axis, and have been at this stage of existence described as a distinct genus, under the name of *auricularia*. In the adult typical holothurians, locomotion is produced by means of rows of ambulacral tube-feet, or by alternate extension and contraction of the body, but in some members the animal moves by means of spicula distributed in the integument. See HOLOTHURIA.

The echinodermata began their existence in the lower Silurian formation, and their remains are found in most sedimentary rocks up to the present time. The cystoidea and blastoidea are extinct, and not more recent than paleozoic. Many crinoids are extinct, having their greatest development in paleozoic time. In the triassic formation is found the beautiful stone-lily. In the Jurassic occurs the pear-encrinite, and in the chalk the tortoise-encrinite. Fossils of asteroidea abound in both upper and lower Silurian rocks, as paleogaster, a beautiful form (q.v.). Many rare and beautiful fossils abound in the oolite, as goniaster, plumaster, and uriaster. The ophiuroidea are rare fossils, the protaster Sedgwickii being an example, found in the silurian; but most of the members are more recent, many reaching to the present time. The echinoidea are represented in the paleozoic rocks by only one family, but numerous fossils are found in mesozoic and recent periods. The echinoids of the secondary and tertiary formations resemble present forms in not having more than twenty rows of calcareous plates.

SUB-KINGDOM IV. ANNULOSA (Lat. *annulus*, a ring). The members of this sub-kingdom have a body which is usually more or less elongated, and always bilaterally symmetrical instead of radiate. Usually the body is divided into segments, which may be definite or indefinite, arranged along an antero-posterior axis. Lateral appendages, when present, are symmetrically arranged. The nervous system consists of one or two ganglia situated anteriorly, or of a double gangliated chain near the ventral surface. This kingdom is divided into three primary sections.

SECTION I. SCOLECIDA (Gr. *scolēx*, a worm), including parasitic worms, wheel-animalcules, etc., whose characteristics are an elongated, flattened body, which may have an annulated integument, but otherwise not at all or imperfectly segmented. There is a water-vascular system, but none for the circulation of an elaborated fluid. The nervous system consists of a few ganglionic masses, or a ring, from which proceed a few filaments, the principal feature which separates them from the ringed worms, or annelida, which have a ventral gangliated nerve chain. The section comprises two divisions, containing seven orders:

DIVISION I. PLATYELMIA (Gr. *platys*, flat). The members of this division have a more or less flattened body, and no true segmentation. It includes two parasitic orders and one non-parasitic order.

Order I. *Tenacida* or *Cestoidea*. See ENTOZOA, HYDATID, and TAPE-WORM. The joints of the tape-worm are generative segments, which are thrown off by a process of gemmation, and are not true segments of the animal, which consists of the head.

Order II. *Trematoda* (Gr. *trema*, a hole). These organisms are known as suckorial worms. See FLUKE, HEMATOZOA, MONOSTOMA, and TREMATODA.

Order III. *Turbellaria* (including *planaria* of Cuvier). See PLANARIA and NEMERTES. These animals are nearly all aquatic and non-parasitic.

DIVISION II. NEMATELMIA (q.v.). Scolecida, having an elongated and cylindrical body. Most of the division have an annulated integument, but there is no true segmentation, and rarely locomotive appendages. They are mostly unisexual, and are parasitic during the whole or a part of their existence. The division comprises three orders:

Order I. *Acanthocephala*, thorn-headed worms (Gr. *akantha*, thorn; *kephale*, head). These animals are entirely parasitic, vermiform, and have no mouth or alimentary canal. They have a proboscis armed with curved hooks. At the base of the proboscis there is a single ganglion of nerve matter giving off radiating filaments in all directions. It has been discovered that, as in the tenacida, the adult worm is developed within a hooked embryo. These *thorn-headed worms* are among the most formidable that infest the intestinal canal of vertebrates, particularly of birds and fishes.

Order II. *Gordiacea*, hair-worms. See NEMATELMIA. These are thread-like, parasitic organisms, which in their earlier stages inhabit the bodies of insects, such as beetles and grasshoppers. They have a mouth and alimentary canal. The sexes are distinct, and they quit their hosts in order to breed. They resemble hairs, and are often many times as long as the insects they infest. See WORMS.

Order III. *Nematoda* or *Nematoidea* (q.v.). Most of these animals are internal parasites, inhabiting the intestinal canal, pulmonary tubes, or cellular tissues of man and other animals; but many are not parasitic. The best known are the *ascaris lumbricoides*, the round worm of the stomach and intestines (see ASCARIS); the *oxyuris vermicularis*, or thread-worm (q.v.); *filaria medinensis*, or Guinea-worm (q.v.); *trichina spiralis* (q.v.), vinegar eel. See SCLEROSTOMA and HEMATOZOA.

DIVISION III. ROTIFERA. Order *rotifera* (wheel animalcule, builder animalcule, flexible creeper). See ROTATORIA. The position of this group is doubtful. It is placed

here by Huxley, but it is sometimes placed among the lower orders of annulosa. These animals have a body composed of numerous segments or somites (Gr. *soma*, body), arranged along a longitudinal axis. They have a nervous system consisting of a double chain of ganglia running along the under surface of the body, with a collar of nervous matter around the gullet. The sub-kingdom is divided into two primary divisions—*arthropoda*, provided with articulated appendages; and *anarthropoda*, having no articulated appendages.

SECTION II. ANARTHROPODA. Locomotive appendages, when present, not distinctly articulated to the body (whence the name). This division contains the earth-worms, leeches, tube-worms, spoon-worms, etc. Divided into three classes:

CLASS I. GEPHYRA (*sipunculoidea*). Body sometimes annulated, sometimes not; no ambulacral tubes or foot-tubercles; sometimes bristles serving for locomotion. The sipunculus and its allies form this class. From certain affinities they have sometimes been placed among the echinodermata, but they do not secrete calcareous matter, and there is no radiate arrangement of the nervous system (see *SIPUNCULUS*). The British species of this class are grouped by prof. E. Forbes as follows:

Family 1. Sipunculacea, having a retractile proboscis, around the extremity of which there is a circle of tentacles.

Family 2. Priapulacea, having a retractile proboscis, but no tentacles.

Family 3. Thalassamacea, proboscis with a long, fleshy appendage; no oral tentacles.

CLASS II. ANNELIDA. Included by Linnæus in his class *vermes*. See **ANNELIDA**. The members of this class have distinct segments, each segment usually corresponding with a single pair of ganglia in the double ventral cord, all the segments being similar except those at the anterior and posterior extremities. Each segment may have a pair of lateral appendages, but they are never articulated with the body. There are four orders:

Order I. Hirudinea (*discophora*, or *suctorial leeches*). These animals are characterized by having a locomotive and adhesive sucker posteriorly, or at both extremities, and by having no bristles or foot-tubercles. They are hermaphrodite, and the young undergo no metamorphosis. See **LEECH**.

Order II. Oligochaeta (Gr. *oligos*, few; *chaite*, hair), earth-worms—*lumbricidæ*; water-worms—*naididæ*; and mud-worms—*limnicole*. These have locomotive appendages in the form of bristles. See **EARTH-WORM**.

Order III. Tubicola (Lat. *tuba*, a tube). These annelides inhabit tubes, sometimes calcareous and secreted by the animals; sometimes composed of a glutinous secretion mixed with grains of sand, forming a cement. Sexes separate; young passing through a metamorphosis. There is a pseudo-hemal system, usually containing red blood, sometimes green. Respiratory organs in spiral, funnel-shaped tufts, or branchiæ. See **TUBICOLÆ** and **SERPULA**.

Order IV. Errantia (Lat. *erro*, I wander), *nercidæ*, *dorsibranchiata*. Respiratory organs in the form of branchial tufts, arranged along the back and sides of the body. This order includes the sand-worms, sea-worms, and sea-mice. Body soft, integument having a great number of segments; head provided with eyes, and two or more feelers, which are not jointed like the antennæ of crustaceans; mouth on the under surface of the head, and having one or more pairs of horny, lateral-working jaws; stomach and intestine usually distinct, and lined with ciliated epithelium; perivisceral cavity filled with a colorless fluid containing corpuscles (Owen). The pseudo-hemal system consists of a dorsal and a ventral vessel connected by transverse branches. There are pulsating dilations at the base of the branchial tufts. The circulating fluid is usually red, but is yellow in some, as the sea-mouse (q.v.). On account of the position of the tufts the members of this order are sometimes called *dorsibranchiate*, or *notobranchiate*. The nervous system in errantia consists of a double, ventral cord, with two ganglia to each segment or somite. The cerebral ganglia, situated in front of the gullet, are large, and send filaments to the eyes and feelers. Among the errantia is the common lob-worm, often used by fishermen for bait. It lives in deep burrows formed in the sand on the sea-shore, the animal passing the sand through its body to get nourishment. There are thirteen pairs of branchiæ or gills, placed one of each pair on a side, in the middle portion of the body. In the nereidæ, or sea-centipedes, the head is distinct, and has eyes and feelers, the mouth having a large proboscis with horny jaws. In the eunicæ the branchiæ are large, and the mouth has from seven to nine horny jaws. The eunice gigantea often has over 400 segments, and is sometimes more than 4 ft. long. Traces of errantia are found in the Cambrian rocks and other formations up to the present time, and the tubicola have left thin sheaths in all formations from the Silurian upwards. See **LUG-WORM**, **LOB-WORM**, **NEREIS**, and **PALOLO**.

CLASS III. CILETOGNATHIA (Gr. *chaite*, bristle; *gnathos*, jaw) (Huxley), arrow-worms (*sagittæ*). This class is constituted to receive the single genus *sagitta*, formerly classed among the annelides. See **SAGITTÆ**.

SECTION III. ARTHROPODA, or ARTICULATA (q.v.). The members of this division of the sub-kingdom annulosa possess jointed appendages, articulated to the segments of the body (whence the name). The following are the chief characteristics: The body is composed of a series of segments arranged along a longitudinal axis, more or less of the segments having articulated appendages, and both being protected by a horny, shell-

like cuticle. The appendages are hollow, containing muscles. The nervous system is in the form of a double chain of ganglia, running along the ventral surface of the body, and united by commissures. The blood-circulatory system is placed near the back, and consists of a contractile cavity provided with valvular apertures. There is communication with a perivisceral cavity, and the system contains true corpusculated blood. Respiration is effected by the general surface of the body, by gills, by pulmonary sacs, or by tubular folds of the integument called *tracheæ*. The arthropoda are divided into four great classes, viz.: the *crustacea*, including the lobsters, crabs, etc.; the *arachnida*, including the spiders, scorpions, etc.; the *myriapoda* (centipedes and millipedes); and the *insecta*, or insects.

CLASS I. CRUSTACEA (Lat. *crusta*, a crust). Respiration effected by gills or by the general body surface. There are two pairs of antennæ. The locomotive appendages are more than eight, articulated to the segments of the thorax, and in most instances to those of the abdomen, the pairs generally being from five to seven. All these animals pass through a series of metamorphoses, and every embryonic organ or part is permanently represented in some member of a lower order. Authorities differ in the classification of the crustacea, but that adopted here divides them into four sub-classes, comprising sixteen orders.

SUB-CLASS I. EPIZOA (Gr. *epi*, upon, and *zōon*, animal). These animals are parasites in the adult state upon the bodies of fishes, but when young they are free-swimming, and have antennæ and eyes. This sub-class contains three orders:

Order I. *Ichthyophthiria* (Gr. *ichthus*, a fish, and *phthir*, a louse). These animals become attached to the skin, eyes, or gills of fishes by a suctional mouth, or cephalic processes, or by a disk borne by the last pair of thoracic limbs, or by hooklets at the extremities of the first pair. The males are usually not attached, but adhere to the females, which are much larger. In attaining the adult condition they pass through retrograde metamorphosis. See LERNEADA.

Order II. *Rhizocephala* (Gr. *rhiza*, root, and *kephale*, head; root-headed). These animals, like those of the preceding order, are free-swimming when young. The larvæ have ovate bodies, one eye, and a dorsal shield. In the second, or pupæ stage, they become inclosed in a bivalve shell and attach themselves to larger crustaceans. They then lose all their limbs, and appear like mere sacks. At the point of attachment they send tubular roots into the body of the host, winding round its intestines.

Order III. *Cirripedia*. Larvæ free-swimming, but a cement-like secretion from a gland is discharged through the antennæ by which they become permanently attached to rocks, wood, cetaceans, turtles, other crustaceans, and sometimes jelly-fishes. The more important members are the *acorn-shells* and the *barnacles*. See BALANUS, BARNACLES, and CIRRIPODA. The cirripedia are divided into three sub-orders, *thoracica*, *abdominalia*, and *apoda*.

SUB-CLASS II. ENTOMOSTRACA (q.v.), divided into two great *legions* or divisions.

DIVISION A. LOPHYROPODA (Gr. *lophouras*, having stiff hairs). Possessing few branchia, and attached to the appendages of the mouth. Feet few, mainly locomotive. Mouth not suctional, but has organs of mastication. There are two orders.

Order I. *Ostracoda* (Gr. *ostrakon*, a shell; *eidos*, form), water-fleas. Small animals inclosed in a shell composed of two valves united along the back by a membrane. The respiratory organs are attached to the posterior jaws, and there are only two or three pairs of feet. Most of them pass through several stages of metamorphosis. See CYPRIS.

Order II. *Copepoda* (Gr. *kope*, an oar, and *podas*, feet). These animals inhabit both salt and fresh water. Head and thorax covered by a shell, and furnished with five pairs of swimming feet, and generally two caudal locomotive appendages. One of the most common of the water-fleas is a member of this order, under the name of cyclops (q.v.). These oar-footed crustaceans are regarded by some zoologists as being the same in the larval state as *ichthyophthiria*, the latter animal becoming modified by being attached to, and existing upon, other animals.

DIVISION B. BRANCHIOPODA (q.v.). These animals have many branchiæ attached to the legs, which are numerous and formed for swimming. This division is made to include *cladocera*, *phyllopora*, and *trilobita*, although the latter departs somewhat from the characteristics of the other members.

Order I. *Cladocera* (Gr. *klados*, a branch, and *keras*, a horn). Carapace or shell similar to ostracoda; feet, four to six pairs, usually bearing respiratory organs; two pairs of antennæ, one pair large, branched, and used for swimming. The *daphnia pulex*, or branched-horned water-flea, is inclosed within a bivalve shell which opens anteriorly. The head is not inclosed, and has a single eye. The gills are in the form of plates, attached to five pairs of thoracic legs. The animal is parthenogenetic (see PARTHENOGENESIS), and it produces two kinds of eggs. One kind, the summer eggs, are deposited between the valves of the carapace, and are hatched there; but the winter eggs are deposited in a receptacle on the back of the carapace, called the saddle, which after a time is cast off and floats about till the water becomes warm enough to hatch the eggs. See WATER-FLEA.

Order II. *Phyllopora* (Gr. *phyllon*, a leaf), leaf-footed crustaceans. Carapace covering

head and thorax, or the body entirely naked. Feet never less than eight pairs, leaf-formed and respiratory, and also used in swimming. They are interesting on account of their affinity to the extinct order of trilobites. The various species of the genus *branchipus* have no carapace, and exist in ponds and swamps in many parts of the world. The brine-shrimps (genus *artemia*) are found in the brine pans of salt-works, and in lakes much saltier than the ocean. They abound in the Great Salt lake of Utah. See BRINE-SHRIMP.

Order III. *Trilobita* (three-lobed crustaceans). See TRILOBITES.

Order IV. *Merostomata* (Gr. *meron*, thigh, and *stomat*, mouth). Crustaceans, often of great size, in which the mouth is furnished with mandibles and maxillæ, whose terminations become walking or swimming feet and organs of prehension. Divided into two sub-orders, *xiphosura* and *eurypterida*.

Sub-order 1. *Xiphosura* (Gr. *xiphos*, a sword; *oura*, a tail). The only living representatives are the king-crabs (horse-shoe crabs), of which there are but few species. See KING-CRAB and MEROSTOMATA.

Sub-order 2. *Eurypterida* (Gr. *euros*, broad, and *pteron*, wing), extinct crustaceans, some of which reached gigantic dimensions. See MEROSTOMATA.

SUB-CLASS IV. MALACOSTRACA (Gr. *malakos*, soft, and *ostrakon*, shell. The name was used by Aristotle to designate the whole class *crustacei*). Crustaceans having generally a definite number of somites, seven belonging to the thorax, and seven to the abdomen, counting the telson, or last segment, or tail. There are two primary divisions.

DIVISION A. EDRIOPHTHALMATA (q.v.). Malacostraca in which the eyes are sessile (whence the name), and the body not protected by a carapace; eyes usually compound, but sometimes simple; as a rule, there are seven pairs of feet, for which reason Agassiz called the division *tetradecapoda*. There are three orders.

Order I. *Laemodipoda* (Gr. *laimos*, throat; *dis*, twice; *podes*, feet). First thoracic segment amalgamated with the head, the appendages of the segment appearing to be inserted into the throat (whence the name). Respiratory organs consist of vesicles, attached to the thorax or bases of the legs; feet hooked; all marine. See WHALE-LOUSE.

Order II. *Amphipoda* (Gr. *amphi*, both; *podes*, feet). Resembles the preceding, but the first thoracic segment is not united to the head; seven pairs of thoracic limbs, some of them directed forwards and some of them backwards, from which fact the order derives its name. They are all small animals. See GAMMARUS and SAND-HOPPER.

Order III. *Isopoda* (q.v.). Respiratory organs in the form of branchiæ attached to the under surface of the abdomen. The young are developed within a larval membrane, which in time bursts, liberating them, but they then have only six instead of seven pairs of limbs, as in the adult state. The isopoda are divided by Milne-Edwards into three sections, which from their habits are called natatorial, sedentary, and cursorial. Some of the natatorial are parasites of fishes. All the sedentary are parasites of the gill-chambers or ventral surfaces of decapod crustacea. The cursorial, or running, are principally land animals, the better known being the wood-louse (q.v.). An aquatic genus is *limnoria* (q.v.). Other well-known isopods are the water-slaters, rock-slaters, shield-slaters, etc. See ASELLUS and WOOD-LOUSE.

DIVISION B. PODOPTHALMATA. See PODOPTHALMA. This division contains the shrimps, lobsters, and crabs, and is divided into two orders.

Order I. *Stomatopoda* (q.v.). See SQUILLA, GLASS CRAB.

Order II. *Decapoda* (Gr. *deka*, ten; *podes*, feet). Branchiæ or respiratory organs contained in cavities at the sides of the thorax. Heart in the form of a quadrate sac, having three pairs of valvular openings. There are great differences in the mode of development. The decapoda are divided into three tribes, the macrura, anomura, and brachyura. See CRAB, CRUSTACEANS, HERMIT CRAB, PEA CRAB, PRAWN, PURSE CRAB, RIVER CRAB, and LAND CRAB.

CLASS II. ARACHNIDA (q.v.). This class resembles the crustacea in many essential characteristics, but there are marked differences. The respiratory organs are never in the form of branchiæ, but of pulmonary vesicles, or ramified tubes or tracheæ, in which they breathe air; there are never more than four pairs of locomotive limbs, and the abdominal sections never have limbs. The eyes are always sessile, while in the higher crustacea they are always borne upon movable peduncles, and both pairs of antennæ are developed. In the higher arachnida one of the two pairs of normal antennæ are never developed (Huxley). The arachnida comprise two great divisions, the *trachearia* and the *pulmonaria*.

DIVISION A. TRACHEARIA. Respiration cutaneous, or by tracheæ (q.v.). Eyes never more than four in number. The division comprises three orders.

Order I. *Podosomata* (Gr. *podes*, feet; *soma*, body). Included in arachnida by Cuvier, but placed by Milne-Edwards among the crustacea, on account of the metamorphoses which they undergo. Having, however, not more than four pairs of legs, they would seem more properly to belong to the arachnida. Among the best known are nymphon and pycnogonum. See PYCNOGONIDÆ.

Order II. *Acarina* or *Monomerosomata* (Gr. *akari*, a mite). Abdomen unsegmented

and united with thorax and head into one mass. Respiration by tracheæ; most of the order are parasites. Usually divided into three families, of which the third, *acarida*, includes the mites and ticks (q.v.). See ACARUS and ACARUS FOLLICULORUM.

Order III. Adelarthrosonmata (Gr. *adēlos*, hidden; *arthros*, joint; *soma*, body). Abdomen composed of segments, but all three parts of the animal united in one mass. Respiration by tracheæ, opening on the ventral surface of the body. The order comprises three families: 1. *Phalangidæ* (q.v.), harvest spiders; 2. *Pseudoscorpionidæ* (q.v.), book scorpion; 3. *Solpugidæ*. In this family the abdomen is in distinct segments, and separated from the thorax.

DIVISION B. PULMONARIA. Higher *arachnida*, as scorpions and spiders. Respiration performed by pulmonary sacs, sometimes aided by tracheæ; six or more eyes; abdomen usually distinct from cephalothorax; divided into two orders.

Order I. Pedipalpi (Lat. *pes*, *pedis*, a foot; and *palpo*, to feel). Scorpions (q.v.) and other animals intermediate between scorpions and true spiders. In this order the abdomen is distinctly segmented, but there is no well-marked division between it and the cephalothorax. *Family 1. Scorpionidæ*; see SCORPION. *Family 2. Thelyphonidæ*, resemble true spiders externally, but are distinguished from them by having a segmented abdomen and no spinnerets, and from the scorpionidæ by the extremity of the abdomen having no sting.

Order II. Araneida. Characterized by the fusion of the head and thorax into one mass, and by an unsegmented abdomen, which is usually soft and joined to the rest of the body by a constricted peduncle. See SPIDER, TARANTULA, and MYGALE.

CLASS III. MYRIAPODA (q.v.). Divided into three orders.

Order I. Chilopoda (Gr. *cheilos*, lip; *podes*, feet; foot-lipped). Centipedes and their allies. See CENTIPEDE.

Order II. Chilognatha (Gr. *cheilos*, lip; *gnathos*, jaw). See MILLIPEDE.

Order III. Pauropoda. This order consists of one peculiar millipede, described by sir John Lubbock under the name *pauropus*. The body is only one-twentieth of an inch long, consisting of ten segments. Found among decaying leaves in damp places, in England and America. Fossil myriapoda; the oldest fossil myriapoda are in the carboniferous formation, where several species of millipedes have been found.

Order IV. Onychophora. In the West Indies, South Africa, South America, and New Zealand, there are peculiar animals of a genus called *peripatus*, which has been classed with leeches, tape-worms, and myriopoda. Their habits are terrestrial, living in decayed wood, under stones, and in moist earth. They have a cylindrical worm-like body, annulated and provided with many pairs of jointed feet, terminated with hooked claws or bristles. The respiratory organs, as recently shown by Moseley, are in the form of tracheæ, which open by numerous apertures.

CLASS IV. INSECTA. Those articulate animals (articulata or arthropoda) which have the head, thorax, and abdomen distinct; three pairs of legs on the thorax, none on the abdomen; a single pair of antennæ; eyes generally compound; usually two pairs of wings on the thorax; respiration by tracheæ. See INSECTS and LARVA. According as insects attain the adult state without passing through a partial or a complete metamorphosis, they may be arranged in three grand divisions: *Ametabola* (without change), *Hemimetabola* (half change), and *Holometabola* (whole change). It will answer the purpose here to simply arrange them into twelve orders, every one of which will naturally fall under one of the above divisions. The ametabola have been called *apterous insects* (q.v.).

Order I. Anoplura (Gr. *anoplos*, unarmed; *oura*, tail). Apterous insects (q.v.) in which the young pass through no metamorphosis; mostly parasitic, on man and other animals (lice, pediculi). Mouth suctorial; body flattened; legs short, with claws; reproduction rapid. See LOUSE.

Order II. Mallophaga (Gr. *mallos*, a fleece, and *phago*, I eat). Aptera, in which the mouth is formed for biting, and furnished with mandibles and maxillæ. They resemble the pediculi, except as to mouth, not sucking the juices of their hosts, but living upon their integuments (bird lice).

Order III. Collembola. Minute aptera having a partial masticatory or suctorial mouth, and the first abdominal segment furnished with a suctorial tube, and next the last abdominal segment with peculiar leaping appendages. This order has been established by sir John Lubbock for the reception of those insects called "spring-tails." Their scientific name, collembola, is given because they attach themselves to foreign bodies by means of their ventral suctorial tube. See PODURA.

Order IV. Thysanura (Gr. *thysanoi*, fringes; *oura*, tail). Aptera generally having a masticatory mouth, and the extremity of the abdomen furnished with long, bristle-like appendages for locomotion, not springing. See LEPISMA.

Order V. Hemiptera (q.v.). Plant lice, cochineal insect. See APHIS, HOP FLY, FROTH FLY, COCCUS, COCHINEAL, COFFEE BUG, CICADA, LANTERN FLY, PHYLLOXERA, HARVEST BUG, HARVEST FLY, and WATER BUG.

Order VI. Orthoptera (q.v.). Grasshoppers, locusts, etc. See COCKROACH, CRICKET, MOLE CRICKET, MANTIS, GRILLUS, EARWIG, PHASMIDÆ, WALKING STICK, and LOCUSTS AND GRASSHOPPERS.

Order VII. Neuroptera (q.v.). Wings four, all membranous, and nearly equal in

size; lace-like in appearance; metamorphosis rarely complete; larvæ six-legged. See MAY FLY, EPHEMERA, DRAGON FLY, ANT LION, CADDIS FLY, GOLDEN EYE-FLY, STONE FLY, and TERMITES.

Order VIII. *Aphaniptera* (Gr. *aphanos*, showing but little). Wings rudimentary, in the form of plates; mouth suctorial; metamorphosis complete. See FLEA and CHIGOE.

Order IX. *Diptera* (q.v.). See also MUSCIDÆ, BOT, TABINIDÆ, CRANE FLY, CECIDOMYIA, HESSIAN FLY, HORSE FLY, HOUSE FLY, FOREST FLY, CHEESE HOPPER, (ESTRIDEÆ, MAGGOT, SHEEP LOUSE, TURNIP FLY, and WHEAT FLY. This order comprises what are commonly known as flies.

Order X. *Lepidoptera* (q.v.). Butterflies and moths (q.v.). See CATERPILLAR, CABBAGE MOTH, CABBAGE BUTTERFLY, CODLIN MOTH, CORN MOTH, CLOTHES MOTH, DEATH'S-HEAD MOTH, GHOST MOTH, GOAT MOTH, GRASS MOTH, HAWK MOTH, PEA MAGGOT, PLUMED MOTH, WINTER MOTH, and TINIDÆ.

Order XI. *Hymenoptera* (q.v.). Wings four, membranous, with few nervures; wings sometimes absent; mouth always having maxillæ, which sometimes aid in forming a suctorial mouth. The order is very extensive. See ANT, BEE, HORNET, WASP, HUMBLE BEE, CARPENTER BEE, GALL FLY, ICHNEUMON, SAW FLIES, and SPHEGIDÆ.

Order XII. *Strepsiptera* (q.v.). These animals are minute parasites on bees, etc. The female is a soft grub without feet, but with a horny head, which it protrudes from between the abdominal segments of its host. The males are winged and active. The larvæ are active, and have six feet.

Order XIII. *Colcoptera* (q.v.). Mouth having an upper lip, two mandibles, two maxillæ, and maxillary palpi; a movable lower lip with two jointed labial palpi. The larvæ usually have thirteen segments, including the head. This order comprises the beetles. See CANTHARIS, CHAFER, COCKCHAFER, PINE CHAFER, BARK BEETLE, CLICK BEETLE, BLAPS, DARKLING BEETLE, COCOANUT BEETLE, GOLIAN BEETLE, GOLDEN BEETLE, HERCULES BEETLE, PEA BEETLE, ROSE BEETLE, ROYE BEETLE, STAG BEETLE, DEATH WATCH, CLOVER WEEVIL, PEA WEEVIL, WEEVIL, MEAL WORM, DYSTICUS, LAMELLICORNES, HOP FLEA, FIREFLY, GLOWWORM, ELATER, MYLABRIS, TURNIP FLY, SCARABÆIDÆ, SCARABÆUS, WINE WORM, and XYLOPHAGA.

SUB-KINGDOM MOLLUSCA (Lat. *mollis*, soft). Soft-bodied animals, usually having a shell or exo-skeleton, and commonly known as shell-fish. The blood-circulating system is placed near the back, the nervous system near the ventral surface, the alimentary canal lying mostly between the two. When well developed, the nervous system consists of three principal nervous masses or ganglia. There is usually, but not always, a heart, or blood-propelling organ. The digestive system consists of a mouth, œsophagus or gullet, stomach and intestine and excretory orifice, though in some the latter organ is absent. The mouth in some is furnished with ciliated tentacles, as in polyzoa; in others with two ciliated arms, as in brachiopoda. In the bivalves, or *lamellibranchiata*, the mouth has four membranous palpi; sometimes it has a complicated system of teeth, as in *gastropoda* and *pteropoda*. Generally there are salivary glands, and the liver is well developed, pouring the bile into the stomach or commencement of the gut. In the mollusca proper, kidneys have also been found. Blood colorless or very slightly tinged. In polyzoa the circulation is effected by the motion of cilia. In *tunicata* the heart is tube-like, and propels the blood periodically in either direction. In the higher orders there is always a distinct heart, which is systemic, consisting of an auricle and a ventricle. See MOLLUSCA. This sub-kingdom includes two great divisions called *molluscoïda* and *mollusca proper*, both comprising seven principal classes.

DIVISION A. MOLLUSCOÏDA. Nervous system consists of only one ganglion, or a pair with accessory ganglia; heart imperfect or absent. Divided into three classes: Polyzoa, tunicata, and brachiopoda.

CLASS I. POLYZOA (q.v.). See also PLUMATELLA.

CLASS II. TUNICATA (q.v.). See also ASCIDIA, PYROSOMIDÆ, and SALPA.

CLASS III. BRACHIOPODA (q.v.). Body protected by a bivalve shell lined by an integument or *mantle*. Mouth furnished with spirally coiled processes or *arms*. Ventral valve usually the larger of the two. All marine; commonly known as lamp-shells. See LAMP-SHELL. This class is divided into ten families.

Family 1. *Terebratulidæ* (Lat. *terebro*, to bore). See TEREBRATULA. Most of these mollusks commenced their existence in the paleozoic rocks, and have survived to the present time, but some are extinct.

Family 2. *Thecididæ* (Gr. *theke*, a sheath). These animals are attached to some object at the sea-bottom by the beak of the ventral, or larger valve. All the known species are included in the single genus thecidium, which commenced in the upper trias, and there is only one species which is not exclusively fossil.

Family 3. *Spiriferidæ*. See SPIRIFERS. These animals had a curiously constructed shell, and their remains are very interesting. They range from the Silurian to the Permian formations, and none have been found later than the lias.

Family 4. *Koninckinidæ*. The only genus known, *koninckina*, is represented by a single species, *K. leonhardtii*, of the trias of St. Cassian.

Family 5. *Rhynchonellidæ* (Gr. *rhynchos*, a beak). Commencing in the lower silurian, one genus only remaining, *rhynchonella* (q.v.). The pentamerus (q.v.), an interesting fossil, ranges from the lower silurian to the carboniferous inclusive.

Family 6. *Strophomenula*. All exclusively paleozoic. Principal genera: *orthis*, *orthisina*, *Davidsonia*, *strophomena*, and *leptena*. See ORTHIDS. The typical species of *orthisina* are silurian; but according to Davidson the genus ranges through the Devonian and carboniferous formations into the Permian.

Family 7. *Productula*. Shell attached to submarine objects by the beak or by means of spines borne by the ventral valve. Genus *chonetes*, found in silurian, Devonian, and carboniferous formations. *Producta* in Devonian to Permian.

Family 8. *Craniada*. This family contains only one genus, *crania*, which is found in the silurian and in all formations to the present time. The fossils are very beautiful and interesting.

Family 9. *Discinula*. Range from silurian to present time. A description of these interesting fossils may be found in the *Paleontology of New York*, by James Hall, and in Dana's *Manual of Geology*.

Family 10. *Lingulida* (Lat. *lingula*, a little tongue). Range from Cambrian period to the present time. Animal fixed by a muscular peduncle passing out between the beaks of the valves. Shell of horny texture, containing phosphorus in its composition. The genus *obolus*, a beautiful fossil, is confined to the silurian rocks. The present representative is *lingula* (q.v.).

DIVISION B. MOLLUSCA PROPER. Those members of the sub-kingdom mollusca which have three principal pairs of ganglia, distributed irregularly in position, and a heart which never has less than two chambers. They are naturally disposed into two groups—the *Acephala*, which have no distinct head, as the oyster and other *lamelli-branchiata*; and the *Enecephala*, in which there is a distinct head, as in the *gasteropods*, *pteropods*, and *cephalopods*. These three latter groups or classes have complicated arrangements of teeth upon the tongue, for which reason they have been given by Huxley the general name *odontophora*. The division *acephala* contains only one class.

CLASS I. LAMELLIBRANCHIATA (q.v.). (Lat. *lamella*, a plate; Gr. *branchia*, gills), called by Lamarck *chonchifera*. These animals have no distinct head; body protected by a bivalve shell, as in the brachiopods, but the shells differ as much as the animals. In the brachiopods one shell is generally considerably larger than the other, while in the lamellibranchiata the two shells are generally of equal size. Again, in the brachiopods either one of the shells is symmetrical, or equilateral; that is, a line may divide it into two equal and relatively similar halves, while the valve of a lamellibranchiate is never quite equilateral. See SHELL. The respiratory organs are two lamelliform gills on each side of the body, whence the name of the class. Sometimes there is only one gill on each side. These gills, or plates, or branchiæ, are composed of tubular rods and a network of capillary vessels. Externally they are furnished with vibratory cilia for the circulation of water over the surface. In some the margins of the mantle (the integumentary covering in all mollusca, and which secretes the shell, see MOLLUSCA) are united to form a closed branchial or respiratory chamber into which water is admitted and expelled by tubes called siphons. In others the margins of the mantle are free. The valves of the shell are brought together by one or two muscles, called *adductors*. Those having but one are called *monomyaria*, those having two, *dimyaria*. Their habits are various; some lie on the bottom, as the oyster and scallop; others are fixed to objects, as mussels; others are sunk several inches deep in the sand on the sea-shore; others bore holes in rocks or wood, while many are free and locomotive. The lamellibranchiata are divided into two sections, with respect to the respiratory organs; those having the margins of the mantle free, without siphons, are with two exceptions called *asiphonida*, the other *siphonida*. Both sections comprise 21 families.

SECTION A. ASIPHONIDA.

Family 1. *Ostreidae*. Shell inequivalve and slightly inequilateral; a single adductor; mantle margins not united; *ostrea*, *ecten*. See OYSTER and SCALLOP.

Family 2. *Arculida*. Mantle margins free. See PEARL OYSTER, PINNA, and MALLEACEÆ.

Family 3. *Mytilida*. Shell equivalve, mantle lobes united between the siphonal openings. One genus is *dreissena* (q.v.).

Family 4. *Arcade*. Shell equivalve; mantle margins separated. See ARCA.

Family 5. *Trigonida*. Shell equivalve, trigonal; mantle margin free. See TRIGONIA.

Family 6. *Unionida*. Shell usually equivalve; mantle margins united between siphonal openings. See FRESH-WATER MUSSEL.

SECTION B. SIPHONIDA.

Family 7. *Chamida*. Shell inequivalve; adductor impressions large; mantle margins united; siphonal orifices small. See CHAMA.

Family 8. *Hippuritida*. Shell inequivalve, unsymmetrical, thick. See HIPPURITES and RADIOLITES.

Family 9. *Tridacnida* (q.v.). Shell equivalve, large, and very beautiful; mantle margins usually united; siphonal orifices surrounded by a thickened border. See CLAM, BEAR'S PAW.

Family 10. *Cardiada*. Shell equivalve, heart shaped, with radiating ribs; mantle open in front; siphons usually short. See COCKLE.

Family 11. Lucinidae. Fossils mostly found in secondary, tertiary, and recent formations, but some are Devonian and carboniferous. See LUCINA.

Family 12. Cycladidae. Shell sub-orbicular; mantle open in front; a single siphon, or two more or less united. *Cyclas* and *cyrena* are the two most important members, and date from the commencement of the cretaceous period to present time. They inhabit fresh water.

Family 13. Cyprinidae. (There is also a genus of fishes of this name.) Shell equivalved; mantle margins united behind by a curtain. The animals comprising this group are represented by *Cyprina* and *Astarte*. The latter has sometimes been assigned to the rank of a distinct family, *Astartidae*. See ASTARTE.

Family 14. Veneridae (q.v.).

Family 15. Mactridae. See MACTRA.

Family 16. Tellinidae (q.v.).

Family 17. Solenidae. See SOLEN.

Family 18. Myacidae. The more important genera are *mya*, *thetis*, and *panopæa* (q.v.).

Family 19. Anatinidae. Mantles more or less united; siphons long, more or less united. This family has considerable paleontological importance, numerous in paleozoic, and reaching a great development in secondary formations.

Family 20. Gastrochaenidae. Mantle margins thick in front; siphons long and united; burrowing in mud, and predaceous upon oysters and other mollusks, burrowing holes through their shells. Range from oolite to the present time. See ASPERGILLUM, GASTROCHAENA, and CLAVAGELLA.

Family 21. Pholadidae. Many fossil species are found in Jurassic rocks. The living genus, *xylophaga*, includes the teredo (q.v.). See PHOLAS.

Encephalic division of mollusca, or *cephalophora*.

CLASS II. GASTEROPODA (q.v.). These animals never inhabit a bivalve shell. Many are naked, but the majority are provided with a univalve, sometimes with a multivalve shell. The gasteropods are divided into two primary sections, *pulmonifera* and *branchifera*, according as their respiratory organs are formed for breathing in free air or in water.

SECTION A. BRANCHIFERA. In this section the respiration is aquatic, by walls of the mantle cavity, or by gills. Divided into three orders.

Order I. Prosobranchiata (*Pectinibranchiata*). Branchiæ pectinated or plume-like and situated in advance of the heart, whence the name.

Section 1. Siphonostomata (q.v.). Margin of shell notched or produced into a canal. Comprises six families.

Family 1. Strombidae (q.v.).

Family 2. Muricidae. See MUREX, PURPLE COLORS, and FUSUS.

Family 3. Buccinidae. See PURPURA, HELMET SHELL, and WHELK.

Family 4. Conidae. See CONE SHELL.

Family 5. Volutidae (q.v.).

Family 6. Cypræidae. See COWRY.

Section 2. Holostomata. Margin of shell seldom notched or produced into a canal.

Family 7. Naticidae.

Family 8. Pyramidellidae. See CHEMNITZIA.

Family 9. Cerithiidae.

Family 10. Melaniidae.

Family 11. Turretellidae (q.v.).

Family 12. Littorinidae, periwinkle (q.v.).

Family 13. Puludinidae, river snails, ampullaria, and paludina, the latter well known.

Family 14. Neritidae. Globose shell; long slender tentacles; mostly marine, and belonging to the tropics; one British species.

Family 15. Turbinidae (q.v.). Top shells. See PHEASANT SHELL and TROCHIDÆ.

Family 16. Haloitidae, ear-shells (q.v.). Shell spiral, ear-shaped. See HALIOTIS and IANTHINA.

Family 17. Fissurellidae (q.v.).

Family 18. Calyptræidae. See CALYPTRÆA.

Family 19. Patellidae. See LIMPET.

Family 20. Dentalidae. See DANTALUM.

Family 21. Chitonidae. See CHITON.

Order II. Opisthobranchiata. Branchiæ placed toward the rear of the body, whence the name.

Section 1. Tectibranchiata. Branchiæ covered by a shell or mantle, a shell in most; sexes united.

Family 1. Tornatellidae. Cretaceous, principally.

Family 2. Bullidae. Bubble shells. See BULLA.

Family 3. Aplysiidae. Shell absent or rudimentary, and concealed by the mantle; animal slug-like (aplysia).

Family 4. Pleurobranchidae. Shell covers only the back of the animal. That of one species is known as the Chinese umbrella.

Family 5. Phyllidiadæ. Shell absent.

Section 2. Nudibranchiata (q.v.). Animals destitute of a shell in the adult condition. Branchiæ external, on the back or sides of the body.

Family 6. Doridæ. Sea lemons. See DORIS.

Family 7. Tritoniadæ. Nearly allied to the preceding.

Family 8. Eolidæ. See GLAUCUS.

Family 9. Phyllirhoidæ.

Family 10. Elysiadæ, elysia, actæonia.

Order III. Nucleobranchiata (q.v.) or *Heteropoda*. Shell present or absent; animal free swimming, in the open sea, with a fin-like tail or flattened ventral fin.

Family 1. Firolidæ. See FIROLA and CARINARIA.

Family 2. Atlantidæ. See BELLEROPHON.

SECTION B. PULMONIFERA. See PULMONATA. Respiration aërial, by means of a pulmonary chamber.

DIVISION I. INOPERCULATA. Shell having no operculum.

Family 1. Helicidæ. See BULIMUS.

Family 2. Limacidæ. See SLUG.

Family 3. Onchidæ. Shell absent; animal slug-like.

Family 4. Limnæidæ. See LIMNÆA.

Family 5. Auriculidæ. See AURICULA.

DIVISION II. OPERCULATA. Shell having an operculum.

Family 6. Cyclostomidæ. Shell spiral; aperture nearly circular. All these animals are terrestrial, beginning in eocene.

Family 7. Aciculidæ. Shell elongated, cylindrical.

CLASS III. PTEROPODA (q.v.). Open sea animals, swimming by means of wing-like appendages on each side of the neck. There is usually a symmetrical, glassy shell, muscular stomach, and well-developed liver. The heart has an auricle and a ventricle. Nervous system composed mainly of one ganglion below the gullet, with branches. Sexes united, young passing through a metamorphosis. Divided into two orders.

Order I. Thecosomata (Gr. *theke*, sheath, and *soma*, body). Having an external shell; respiratory organs contained in a cavity in the mantle.

Family 1. Hyalidæ. See HYALEA.

Family 2. Limacinidæ. Shells minute, spiral; *spiralis*.

Order II. Gymnosomata (q.v.), (Gr. *gymnos*, naked; *soma*, body). See CLIO.

CLASS IV. CEPHALOPODA (q.v.). Divided into two distinct and well-marked orders.

Order I. Dibranchiata. Having two branchiæ and an ink-bag; comprising two sections, Octopoda and Decapoda.

Section A. Octopoda. Having not more than eight arms, which are provided with sessile suckers.

Family 1. Argonautidæ. See ARGONAUT.

Family 2. Octopodidæ. See POULPE.

Section B. Decapoda (Gr. *deka*, ten; *podes*, feet). Arms eight, with two clavated tentacles, making ten; suckers pedunculated.

Family 3. Tenthidæ. See HOOK SQUID.

Family 4. Belemnitidæ. See BELEMNITES.

Family 5. Sepalidæ. See CUTTLE-FISH.

Family 6. Spirulidæ.

Order II. Tetrabranchiata (q.v.). Having four branchiæ (whence the name); no ink-bag; more than ten arms, and these without suckers.

Family 1. Nautilidæ. See NAUTILUS.

Family 2. Ammonitidæ. See AMMONITES, CERATITES, and BACULITES.

INYO, a co. of California, bounded w. by the Sierra Nevada, and e. by Nevada; 4,725 sq. m.; pop., '80, 2,928. One of the lofty peaks of the Sierra Nevada here is Mt. Whitney. Owens river flows into Owens lake, a large body of water. Part of the valley of the river is fertile. Gold, copper, tin, sulphur, and salt are found. The staple products are grain, hay, wool, and pork. There are some quartz and saw mills. Capital, Independence.

IO, in Greek mythology the daughter of Inachus or Iasus, and priestess of Juno at Argos, was loved by Jupiter, who, on account of Juno's suspicions, changed her into a white cow. Juno having obtained of him the cow as a present, set the hundred-eyed Argus to watch her. Mercury by command of Jupiter killed Argus and released her. Juno then sent a gad-fly, which pursued her until in her wanderings she reached Egypt, where she recovered her original form. The full account of this myth is found in the Prometheus of Æschylus. According to the usual explanation, Io symbolically represents the moon, Argus the stars, and Mercury the clouds.

IODOFORM, a substance of analogous composition to chloroform (q.v.), the chlorine in the latter being replaced by iodine, its formula being CHI₃ (using modern equivalent numbers). It is a solid, yellow crystallizable substance, obtained by the action of tincture of iodine upon an alcoholic solution of potash, the reactions being similar to those which take place in making chloroform by this method. It melts at 246.2° F., but distills with the vapor of water at 212°. It possesses some of the

anæsthetic properties of chloroform, but it has a wider use in medicine, being employed in those cases in which the action of iodine (q.v.) is indicated. At the same time it will relieve pain, and is therefore peculiarly applicable in cases of painful tumors. It is said to be a successful application to ringworm of the scalp, to ulcers of the cornea, and for promoting the healing of burns and blisters. Gastralgia, alone or connected with ulcer of the stomach, has been relieved by its administration, and different forms of external neuralgia are said to have been cured by it. The dose of iodoform is from one to three grains three times a day, given in the form of a pill. As an catward application it may be dissolved in glycerine or alcohol, or an oil; or it may be prepared in the form of an ointment. A common form for topical application is a solution of one part of iodoform in four parts of sulphuric ether.

ION, in Grecian mythology the reputed son of Xuthus and Creusa; but Euripides in his tragedy *Ion* makes him the son of Apollo.

IONA ISLAND, a small island in the Hudson river, in Rockland co., about 40 m. from New York. It has extensive vineyards, and is a popular resort for excursions.

IONIA, a village of Michigan, on Grand river, and on the Detroit and Milwaukee railroad, 38 m. n.w. of Lansing; pop. 3,251. It has 8 churches, 2 national banks, a high school, a public park, a state-prison, 2 iron foundries, a brewery, a pottery, a brickyard, 2 flouring mills, railroad repair-shops, and 2 newspapers.

IO'NIA, a co. in central Michigan; 576 sq.m.; pop. '74, 28,376. It is watered by Grand, Flat, Maple, and Looking-glass rivers. The surface is undulating, and there are extensive forests of beech, pine, and sugar-maple. The soil is generally fertile. The chief products are wheat, maize, oats, hay, wool, and lumber. The Detroit, Lansing and Lake Michigan, and the Detroit and Milwaukee railroads intersect the county. There are numerous manufactories for carriages, agricultural implements, saddlery, sash, doors and blinds, and woolen goods; also flour and saw mills. Cap., Ionia.

IONIAN SEA, a name anciently given to that part of the Mediterranean which washed the shores of Greece and Epirus, separating them from Italy and Sicily. It is connected with the Adriatic by the strait of Otranto. The name is found first in Æschylus, but its origin and exact meaning are doubtful.

IO'NIES, a small tribe of Indians of the family of the Caddoes, and said by Spanish writers to be a part of the confederacy known as the Texas. They consider the Hot springs of Arkansas as their original abode, whence they afterwards removed to Texas. They are a peaceful tribe, and cultivate the land for their support. In 1859 they were removed by the government to a district on the Wichita river, Indian territory.

IOS'CO, a co. in s. Michigan, on lake Huron and Saginaw bay; 550 sq.m.; pop. '70, 3,163. It is intersected by the Au Sable and Au Gres rivers. It is nearly level, and has extensive forests of pine trees. There are many saw mills, and the principal export is lumber. Cap., Tawas city.

IOWA (*ente*) is the most purely agricultural of all the United States. The beauty of its scenery, the evident fatness of its soil, its natural good drainage, attracted the best class of farmers and business emigrants from the north-eastern states, filling it with a population of great thrift, energy, and intelligence. Midway between the Atlantic and Pacific oceans, drained e. by the Mississippi and w. by the Missouri, and in the zone of the greatest movement of migration, it became populous with a rapidity never before equalled in the history of states so purely agricultural, or which have no extraordinary city growth; and its wealth and population are distributed with remarkable uniformity.

History.—Iowa was originally a part of the immense territory included in Louisiana, and ceded to the United States in 1803. Its name, signifying in the Indian language "the beautiful country," is derived from the river so designated. The first white settlement within the limits of the state was made in 1788 by Julian Dubuque, a Frenchman from Canada, who obtained a grant of a large tract, including the city now bearing his name, and the rich mineral lands surrounding it. He built a fort, carried on the mining of lead, and traded with the Indians until his death in 1810. In 1834 the territory now constituting the state of Iowa was placed under the jurisdiction of Michigan, and in 1836 under that of Wisconsin. In 1833 settlements were made near Burlington by companies from Illinois and other states, and, a few years later, at other points along the Mississippi. In 1838 the territory of Iowa was organized in due form, the seat of the government being fixed at Burlington. It included within its boundaries at that time the greater part of the present state of Minnesota, and the whole of Dakota territory. In 1839 the government was removed to Iowa city. In 1844 a state constitution was framed and admission to the union prayed for; but congress was dissatisfied with the boundaries assumed, and therefore denied the petition. Soon afterwards congress defined the boundaries that would be acceptable, and they were approved by the people of the territory; and on Dec. 28, 1846, the new state was admitted to the union. In 1857 the capital was fixed at Des Moines. The constitution at present in force was adopted in 1857. According to the state census of 1873 the pop. was 1,251,333; number of families, 238,098; dwellings, 231,540; voters, 261,205. In 1870 there were 24,115 persons 10 years old and upward who could not read, and 45,671 who could not write; and of these illiterates, 24,979 were of native, and 20,692 of foreign birth.

The state is well watered, its streams being all affluents of the great rivers which bound it on the e. and west. The Des Moines, the Checaque or Skunk, and the Iowa and its affluents flow into the Mississippi. Those flowing into the Missouri are the Big Sioux (forming a part of the w. boundary), the Chariton, Grand, Platte, Nodaway, and Nishnabotona. The Iowa rises in Hancock co., in the northern part of the state, and joins the Mississippi 35 m. above Burlington. It is nearly 300 m. long, and is navigable 80 m. to Iowa city. The largest of the interior rivers is the Des Moines, which has a course of 300 m. within the state, draining upwards of 10,000 sq. m. of territory. Next to the Des Moines in size is the Red Cedar, which rises in Minnesota, and empties into the Iowa. In the northern portion of the state are many small but picturesque lakes, of the same kind as those so numerous in Minnesota. The largest of these is lake Okoboji, in Dickinson co., 15 m. long, and from one-fourth of a m. to 2 m. wide. The southern portion of the state is especially beautiful in its undulations, which are intersected by the larger rivers with their fertile valleys. In the n.e. the surface is more elevated, and there are hills and mounds covered with oaks, while the rivers sometimes tumble over precipitous walls of rock. Lead ore and other metals are found in this section in abundance, while the land is of an excellent quality. The prairies of the state are of great extent, and unrivaled beauty and fertility. Coal is found in abundance in the s. and w. portions of the state, the measures extending over an area of 20,000 sq. miles. Extensive beds of superior peat are found in the northern part of the state. The lead-mine tract is in a belt occupied by Galena limestone, which touches the Mississippi at Dubuque, and lies along the valley of the Turkey river in a n.w. direction. The mines have been worked only in the immediate vicinity of Dubuque, where they are very productive. From 4,000,000 to 6,000,000 lbs. of ore, yielding 70 per cent of lead, have been smelted there annually for some time past. Small deposits of iron ore are found in some parts of the state, and a deposit of gypsum of great purity exists upon a small area near Fort Dodge. Building-stone of excellent quality is abundant. The soils of the state are generally very good, and there is but little inferior land. The valleys of the Iowa, Red Cedar, and Des Moines, especially, are of unrivaled fertility. The climate is well adapted to agricultural operations. The winters, owing to the prevalence of n. and n.w. winds, to which nature offers no obstruction, are severe; but the winds of the summer, which are equally free, serve to temper the heat. The mean temperature of the year is 48°; spring, 47°; summer, 70½°; autumn, 45°; winter, 23½°. There is probably no healthier country than Iowa in the world, a fact which may safely be attributed to the excellent drainage afforded by its streams and its undulating surface. The southern part of the state, along the rivers, is well wooded. In the northern portion trees are comparatively scarce, though groves of pine and cedar are found in some places. The most common trees are ash, elm, sugar and white maple, hickory, walnut, oak, poplar, and basswood. Of fruit trees, the apple, pear, and cherry grow in perfection. The wild grape, plum, and gooseberry are indigenous.

The state, agriculturally considered, is in the foremost rank. For the cultivation of the cereals it is unsurpassed. Potatoes grow in great perfection, and the soil and climate are also favorable for flax, tobacco, and the castor-oil plant. In Crawford co., in the western part of the state, some experiments have been made in tea-culture, and 700 lbs. to the acre have been produced. In 1870 the state contained 9,396,467 acres of improved land, 2,524,796 of woodland, and 3,620,533 of other unimproved land. The number of farms was 116,292, of which 34,041 contained from 20 to 50 acres; 41,372 from 50 to 100; 30,142 from 100 to 500; 321 from 500 to 1000; and 38 over 1000. The cash value of these farms was \$392,662,441; of farming machinery and implements, \$20,509,582; wages paid during the year, \$9,377,878; estimated value of all farm productions, \$114,386,441; value of orchard products, \$1,075,169; of garden products, \$244,963; of forest products, \$1,200,468; of animals slaughtered or sold for slaughter, \$25,781,223; of live-stock, \$82,987,133; of home manufactures, \$521,404. The number of horses was 433,642; of mules and asses, 25,485; of milch cows, 369,800; of other cattle, 614,366; of sheep, 855,493; of swine, 1,353,908. The number of live-stock assessed for valuation in 1878 was: cattle, 1,530,056; horses, 672,898; mules, 42,566; sheep, 301,743; swine, 2,324,116. The amount of agricultural productions in 1870 was: wheat, 29,435,692 bush.; corn, 21,005,142; rye, 505,807; oats, 21,005,142; barley, 1,960,779; buckwheat, 109,432; peas and beans, 42,313; potatoes, 591,462; sweet potatoes, 34,292; clover seed, 2,475; grass seed, 53,432; flax seed, 88,621; hay, 1,777,389 tons; tobacco, 71,792 lbs.; wool, 2,967,043; butter, 27,512,179; cheese, 1,087,741; maple sugar, 146,490; hops, 171,113; flax, 695,518; honey, 853,213; wine, 37,518 gallons; sorghum molasses, 1,318,635. In 1872 the improved lands had increased to 9,987,788 acres. The production of wheat in that year was 32,437,836 bush.; of corn, 141,744,522; of oats, 22,113,013; of barley, 5,770,169; of wool, 2,348,884 lbs.

The statistics of manufactures in 1870 presented these figures: Number of establishments, 6,566; capital invested, \$22,420,183; wages paid, \$6,893,292; persons employed, 25,032, of whom 23,395 were males above 16, and 951 females above 15 years of age; value of products, \$46,534,322. The principal industries were: agricultural implements, blacksmithing, boots and shoes, carpentering and building, carriages and wagons, flouring mills, furniture, malt liquors, lumber, pork packing, saddlery and harness, and woolen goods.

The state, while it has no direct foreign commerce, has an extensive trade with Atlantic ports and with the interior. There are three United States ports of delivery—Burlington, Dubuque, and Keokuk. The tonnage in 1870 was 5,489, mostly at Dubuque, where there is some ship-building. In 1873 there were in the state 75 national banks, with a capital of \$6,017,000, and a circulation amounting to \$5,674,385. The number of savings banks in 1877 was 20, with assets amounting to \$3,301,209; liabilities, including capital stock, \$3,104,614; undivided profits, \$196,594. There were at the same time 31 banks of issue and deposit organized under state law, with assets amounting to \$3,190,063.

Railways.—Iowa is in the direct line of trans-continental commerce. Five great railways traverse the state from e. to w. and connect directly or indirectly with the Union Pacific railroad. These are, beginning from the s., the Chicago, Burlington, and Quincy, entering the state e. at Burlington and w. at Council Bluffs; the Chicago, Rock Island, and Pacific, entering e. at Davenport and w. at Council Bluffs; the Chicago and North-western, entering e. at Clinton and w. at Council Bluffs; the Illinois Central, entering e. at Dubuque and w. at Sioux City; and the Milwaukee and St. Paul, entering e. at McGregor and w. at Council Bluffs. Besides these e. and w. roads, other lines of roads, together with the ramifying branches of those already named, form a system of connections southward and south-easterly towards the Mississippi and Missouri rivers and St. Louis. These are: the Chicago, Clinton, and Dubuque, and the Dubuque and Minnesota, on the w. bank of the Mississippi from Clinton on the s. to the northern boundary of the state; the Davenport and St. Paul, the Burlington and Minnesota, the Burlington, Cedar Rapids, and Minnesota, the Central of Iowa, the Keokuk and Des Moines, and Des Moines and Fort Dodge, the Sioux City and St. Paul, and the Sioux City and Pembina. From the older of these roads there are many branches, so that there are few farming districts in the state more than 20 m. from a railway. In its early settlement the territory relied largely on the Mississippi and Missouri rivers, which bound it e. and w., as outlets for its products. Now its network of railways convey most of its surplus eastward and distribute merchandise from older states almost at the producers' doors. The new territories and mining regions westward also consume a part of its surplus. The value of railroad property in the state in 1879 was \$22,540,904; miles of track, 3,922; capital stock, \$90,612,451; aggregate debt of all the roads, \$70,243,795; earnings for the year ending June 30, 1879—passengers, mail, and express, \$5,335,177; freight, etc., \$16,005,532;—total, \$21,340,709; expenses, \$12,904,420; net earnings, \$8,436,288. The aggregate amount of taxes paid by the roads in 1878-79 was \$584,169. There are in the state over 1200 m. of steel rail. The miles of track of some of the principal roads in the state are as follows: Chicago, Rock Island, and Pacific, 310; Burlington, Cedar Rapids, and Minnesota, 248; Burlington and Missouri River, 292; Central of Iowa, 189; Chicago and North-western, 272; Des Moines Valley, 249; Illinois Central, 403. All railroad property is taxable at the same rates and in the same manner as that of individuals, and the state exercises a thorough supervision over the roads to prevent unjust discriminations in rates of fare and freight. The government canal, constructed around the Des Moines rapids at Keokuk, was opened in 1877. It is $7\frac{1}{2}$ m. long and 300 ft. wide, and has three locks, each 350 ft. long. It cost not far from \$4,400,000.

The debt of the state is \$545,435, nearly half of which is due to the permanent school fund.

The public institutions maintained by the state are the college for the blind at Vinton; the school for the deaf and dumb at Council Bluffs; the hospitals for the insane at Mount Pleasant and Independence; the soldiers' orphans' homes at Cedar Falls, Davenport, and Glenwood; the reform school for boys at Eldora, and one for girls near Salem; and two penitentiaries, one at Fort Madison, the other at Anamosa. The common school system is under the joint direction of state and county superintendents and district directors. The number of persons of school age (between 5 and 21) in the state in 1878 was 577,353; number enrolled, 431,317; number in attendance, 264,702. The number of school districts in 1873 was 2,536; graded schools, 419; schools ungraded, 8,397; school-houses, 8,856; number of teachers—males, 6,091; females, 10,193—total, 16,284; average monthly compensation of male teachers, \$36.28; of females, \$27.68. The number of private schools was 121; of their teachers, 364; of their pupils, 12,132. The amount of the permanent school fund in 1873 was \$3,294,742, producing an income of \$275,789; total expenditure in that year for school purposes, \$4,229,455, of which \$2,248,676 was for the salaries of teachers. There is no state school devoted exclusively to the training of teachers. Among the higher institutions of learning in the state are the following: The state university at Iowa City, and the state agricultural college at Ames, both under the patronage of the state; Upper Iowa university at Fayette, Methodist; Tabor College at Tabor, Congregational; German college at Mt. Pleasant, Methodist; Iowa Wesleyan university at Mt. Pleasant, Methodist; Whittier college at Salem, Friends; Humboldt college at Springvale; Cornell college at Mt. Vernon, Methodist; Western college at Western, United Brethren; Oskaloosa college at Oskaloosa, Disciples; Central university of Iowa at Pella, Baptist; Amity college at College Springs; university of Des Moines at Des Moines, Baptist; Iowa college at Grinnell, Congregational; Penn college at Oskaloosa, Friends; Simpson Centenary

college at Indianola, Methodist; Norwegian Luther college at Decorah, Lutheran; and Burlington university at Burlington. The whole number of professors and teachers in these institutions in 1873-74 was 168, of students 3,570. The agricultural college admits students of both sexes and unites manual labor with study. The number of libraries in the state, according to the census of 1870, was 3,540, of which 2,387 were private; volumes in the public libraries, 377,851; in the private libraries, 295,749. The chief of the public libraries are the state library at Des Moines and the state historical library at Iowa City. According to the state census of 1873, periodicals published in Iowa were 22 daily, 2 tri-weekly, 6 semi-weekly, 272 weekly, 2 semi-monthly, 19 monthly, and 1 bi-monthly. The number of religious organizations, according to the census of 1870, was 2,763; church edifices, 1446; church property, \$5,730,352. The chief denominations are the Baptist, Christian, Congregational, Episcopal, Friends, Jews, Lutheran, Methodist, Presbyterian, Reformed, Roman Catholic, Second Advent, United Brethren in Christ, Universalist, and Unitarian.

The general election is held on the 2d Tuesday in Oct., except in the years of the presidential election, when it occurs on the Tuesday next after the first Monday in November. The governor and lieutenant-governor are elected for 2 years by a plurality of the popular vote. The salary of the former is \$3,000 per annum. The legislature consists of a senate of 50 members elected for 4 years, half of them biennially, and a house of 100 members elected biennially. The sessions are biennial, occurring in the even years. Senators must be 25 years of age, representatives 21 years, and the governor and lieutenant-governor 30 years. The secretary of state, auditor of state, register of state land office, and superintendent of public instruction are elected for 2 years, and each has a salary of \$2,200. The governor appoints the adjutant- and inspector-general and the state librarian for terms of 2 years. The supreme court consists of four judges, elected by the people for 6 years, one every second year, and the one having the shortest time to serve is chief-justice. Judges of the district court are elected in single districts for 4 years. The judges of the supreme court receive a salary of \$4,000, those of the district court \$2,200 per annum. Circuit courts, consisting of a single judge, are held by the district court judges. The constitution prohibits the lending of the credit of the state for any purpose, or the borrowing of more than \$250,000 at any one time, but permits a larger debt to be contracted to repel invasion or suppress insurrection. No corporation can be created by special law, and stockholders in banks are individually liable to double the amount of their stock. The legislature is prohibited from granting divorces or authorizing lotteries. The property rights of husbands and wives are equal, each upon the death of the other inheriting one-third in value of his or her real estate, while neither is liable for the separate debts of the other. The contracts made by the wife in her own name are enforced by or against her precisely as if she were unmarried. A married woman may sue and be sued without the husband being joined in the action. Women are by law eligible to all offices connected with public schools. The state offers a premium for the planting of forest trees by deducting a certain sum from the taxes of citizens in proportion to the number of trees they may set out. The amount of property thus exempted from taxation for the years 1879 and 1880 is estimated at nearly \$6,000,000. A new state capitol is nearly completed. Its greatest length is 263 ft., and its greatest width 246 feet. It is estimated to cost not far from \$2,000,000. The electoral votes of Iowa for president and vice-president of the United States have been cast as follows: 1848, 4 for Cass and Butler; 1852, 4 for Pierce and King; 1856, 4 for Fremont and Dayton; 1860, 4 for Lincoln and Hamlin; 1864, 8 for Lincoln and Johnson; 1868, 8 for Grant and Colfax; 1872, 11 for Grant and Wilson; 1876, 11 for Hayes and Wheeler.

IOWA, a s.e. co. of Iowa, intersected by the Iowa and the n. branch of the English rivers; 578 sq.m.; pop. '75, 17,456. It is nearly level, well-wooded, and has a fertile soil, much of it prairie. The staple productions are wheat, oats, maize, potatoes, hay, and pork. It is traversed by the Chicago, Rock Island, and Pacific railroad. Bituminous coal is here found. Capital, Marengo.

IOWA, a co. in s.w. Wisconsin; 750 sq.m.; pop. '75, 24,133. It is bounded by Wisconsin on the north. The surface is varied by hills, valleys, and forests, the latter not extensive. The soil is fertile, yielding wheat, maize, oats, and hay. Mines of zinc and copper have been opened, and lead is abundant. A division of the Milwaukee and St. Paul railroad passes along the n. border, and Mineral Point railroad runs to the county seat, Dodgeville.

IOWA CITY (*ante*) is the capital of Johnson co., and was, 1839-57, the capital of Iowa territory and state; pop. '74, 9,000. It is 54 m. from Davenport, and 120 m. from Des Moines, and connected with these by the Chicago, Rock Island, and Pacific railroad. The city is built on a high plateau 150 ft. above the river, and surrounded by hills. The Iowa university, established 1860, and occupying the building formerly used as the capitol, has 4 departments, 600 students, a library of 6,500 volumes, and is open for both sexes. The city contains two national banks, a savings-bank, 3 academies, a high school, 15 churches, a foundry, a paper-mill, manufactories for carriages, plows, pumps, cigars, linseed oil, and alcohol, and has also a number of flouring mills. There are also several newspapers, one of which is in the Bohemian language.

IOWA COLLEGE, at Grinnell, Poweshiek co., Iowa; organized in 1848, under the auspices of the Congregationalists. It comprises preparatory, academical, normal, medical, and law departments. Professors in 1878, 15; students, 120. President, Geo. F. Magoun, D.D.

IOWA RIVER, a river of Iowa rising in Hancock co. Flowing s.e. 300 m., it empties into the Mississippi. It is navigable for small vessels 80 m. to Iowa city.

IOWA STATE AGRICULTURAL COLLEGE, at Ames, Story co.; organized in 1869, with an endowment of 204,309 acres of land, appropriated by act of congress of July 2, 1862; annual income, \$41,000. The college farm contains 873 acres, of which 60 acres are included in the lawn and ornamental grounds. The main college building is four stories high above the basement, 150 ft. long by 112 ft. deep through the wings. In the basement are dining-hall, kitchen, laundry, experimental kitchen and laundry, printing-office, and armory. The laboratory is of brick, two stories high, and 70 by 44 feet. Another brick building is devoted to botany and veterinary science, and behind it is the veterinary hospital and dissecting room. The library contains 6,000 volumes. The museum occupies a large room in the main building. It includes mounted specimens of a few mammals; several hundred birds (mounted), representing the avian fauna of the state; a large collection of reptiles, in alcohol; a few fishes; and a small but typical collection of invertebrates. A set of the "Ward models," illustrating the principal larger fossils, and a cabinet of mineralogical specimens, are of service in the study of geology. There are, besides, the following collections in the process of formation: A seed collection; an entomological cabinet; sets of the eggs and nests of birds; the brains of vertebrates; skulls of mammals; and skeletons of vertebrates. Each department is well supplied with apparatus. Women are admitted to all the courses of study. Number of professors in 1880, 13; other teachers, 9; students, 284; alumni, 165. All male students are required, unless excused by the proper authority, to wear the prescribed uniform, attend all military exercises in their respective classes, and become members of the college battalion. President, A. S. Welch.

IOWA STATE UNIVERSITY, in Iowa City, was organized in 1847, with an endowment by congress of two townships of land; to which was added in 1878, by the state, \$20,000 annually. Its annual income, from all sources, is \$51,000. The campus embraces an area of 10 acres, on which are placed the three principal college buildings. Besides these, there are, outside the campus but on land owned by the university, an observatory, hospital, and homeopathic medical college. There is a large laboratory for physical science, with a select apparatus of excellent quality; a laboratory for natural science, with a dozen good microscopes; a cabinet, not large, but select in the department of corals, and birds of Iowa. The library contains about 15,000 volumes. Number of professors in 1880, 22; lecturers and instructors, 18; students, 540; alumni, 1231. Women are admitted to all the courses of study. There is no gymnasium, but regular military drill and instruction. There is a law department, with two professors. The medical department embraces instruction in both the allopathic and homeopathic schools. President, J. L. Pickard, LL.D.

IOWAS, a tribe of American Indians of the Dakotah family, called Iowas by some of the Algonquins, but known among themselves by the name of Palnucha. In 1700 they lived on the Mankato river, Minnesota, numbering 1500, and often at war with the Osages and other tribes. At different times treaties have been made with them by the United States, by one of which, 1836, they were removed to the w. bank of the Missouri above Wolf river. They have been greatly reduced by intemperance, war, and disease. By a treaty, 1861, they ceded to the United States all but 16,000 acres. The remnant of this tribe, numbering now only 225, is under the charge of the Friends, who have a school of over 60 pupils and an orphans' industrial home.

IPHICRATES, an Athenian general conspicuous in the first half of the 4th c. B.C. He is distinguished for his improvements in military tactics, especially for the light oval target instead of the round heavy buckler of earlier use. A common mode of warfare among the Greek states, who were often at war, was by sudden incursions into each other's territories, and rapid retreats. Iphicrates, seeing that safety required light armor, organized a body of soldiers carrying a light target, and from it called *Peltastæ*. Their discipline and efficiency were such that but few of the heavy-armed infantry dared to meet them. With these he attacked a Spartan corps near Corinth, 392 B.C., and totally destroyed it. This was followed by successive victories, and his military career was very brilliant. In the Hellespont and with the Persians in Egypt he served with high distinction. After the peace of Antalcidas he married the daughter of Cotys, king of Thrace, and formed an alliance with him against the Athenians for the possession of the Thracian Chersonesus. Subsequently the Athenians pardoned him, and gave him a joint command in the social war. Though accused by one of his colleagues of misconduct, he was honorably acquitted. He lived after this quietly in Athens, where he died at an advanced age.

IPSUS, a t. of Phrygia, Asia Minor, near, as is supposed, the modern village of Bulavadin, and noted for the battle, 300 B.C., in which Antigonus and his son Demet-

rius were overthrown by Alexander's four generals, Ptolemy, Seleucus, Cassander, and Lysimachus. Ipsus was the seat of a Christian bishop in the 7th and 8th centuries.

IPSWICH, a t. of Essex co., Mass., 27 m. n.e. of Boston, on the Ipswich river and the Eastern railroad; pop. '80, 3,699. It has 6 churches, a savings-bank, a girls' school of high character, established 1828; an insane asylum, a public library, a high school, a classical academy established 1650, factories for boots, shoes, and hosiery; also planing, saw, and grist mills. The Indian name is Agawam.

IPSWICH, a t. of Queensland, Australia, on the Bremer; pop. '71, 5,092. It has a number of churches, a grammar-school and a hospital, and is a place of increasing business importance.

IRANIC RACES AND LANGUAGES. See PERSIAN LANGUAGE AND LITERATURE, *ante*.

IREDELL, a co. of w. North Carolina; 600 sq.m.; pop. '80, 22,672. It is drained by branches of the Gadkin, and is well-wooded, hilly, and fertile. The staple products are grain, cattle, wool, and tobacco. Gold is found. It is traversed by the Western railroad. Capital, Statesville.

IREDELL, JAMES, 1751-99; b. England, of Irish ancestry. He emigrated to North Carolina at the age of 17, was admitted to the bar in 1770, made deputy attorney-general in 1774, judge of the state supreme court in 1777. He was attorney-general of North Carolina, 1779-82; and judge of the United States supreme court from 1790 until his death. He was a man of ability and learning. In 1791 he published *Iredell's Revision of the Statutes of North Carolina*. His judicial opinion in the case of "Chisholm vs. Georgia" is said to contain the germs of the doctrine of state rights as subsequently developed. He died in Edenton.

IREDELL, JAMES, 1788-1853; son of James; b. N. C. He graduated at the college of New Jersey in 1806, and was admitted to the bar. For 10 years he was a member of the legislature, and twice speaker of the lower house. In the war of 1812 he commanded a company of volunteers at Norfolk, Va. In 1819 he was chosen judge of the superior court; in 1827 was governor of the state; and U. S. senator in 1828-31. For many years after this he was a reporter of the decisions of the state supreme court, and published 13 volumes of law and 8 of equity reports. In 1823 he was one of a commission to collect and revise the state statutes. He published also a treatise on the law of executors and administrators.

IRELAND, CHURCH OF, the Irish branch of the Episcopal church of England and Ireland, established by law in Ireland, according to the act of union passed Jan. 1, 1801. The established church of Ireland, considering itself the rightful successor of the mediæval Roman Catholic church, took possession of the dioceses, parishes, and church property, and for a long time retained the divisions then existing. The Roman Catholics, constituting a large majority (77 per cent) of the population, have always regarded as unjust the existence, in their country, of an established Protestant church in connection with that of England. Notwithstanding its small membership the church had, in 1833, 4 archbishoprics, 18 bishoprics, the income from which was estimated at from £130,000 to £185,000. In that year the first inroad was made upon the prerogatives of the established church in the reduction of the archbishoprics to two and the bishoprics to ten. In 1868, on motion of Mr. Gladstone, the English house of commons voted to disestablish the church of Ireland. The house of lords rejected the proposition. But so strong was the expression of public opinion against the continuance of the privileges of the Irish church that the royal commissioners on the revenues and condition of the church of Ireland, recommended in their report, July 27, 1868, important reductions as to its benefices. They suggested, among other changes, the abolition of four bishoprics and one archbishopric, and that all benefices with less than 40 Protestants should be suppressed. At the close of the year 1868 Mr. Gladstone became prime minister and introduced, in Mar., 1869, a new bill for the disestablishment and disendowment of the Irish church, which, after a long and earnest debate, passed both houses of parliament, and on July 26 received the royal assent. The bill, containing 60 clauses, is entitled, "A bill to put an end to the establishment of the church of Ireland, and to make provision in respect to the temporalities thereof, and in respect to the royal college of Maynooth." The disestablishment was to be total and to take place Jan. 1, 1871, when the ecclesiastical courts and laws were to cease, the bishops to be no longer peers in parliament, the ecclesiastical commission terminate, and a new commission of church temporalities, composed of ten men, appointed, in which the whole property of the Irish church should be vested. Public endowments, including state grants or revenues (estimated at £15,500,000), were to be retained by the state, and private endowments, such as money given from private sources since 1660 (valued at £500,000), were to remain with the disestablished church. The vested interests connected with Maynooth college, with the Presbyterians who were receiving the *regium donum*, and the incumbents, were to be secured. The aggregate of the payments would amount to about £8,000,000, leaving £7,500,000 at the disposal of parliament, and which should be appropriated "mainly to the relief of unavoidable calamity and suffering." A general convention held in Dublin, 1870, adopted a constitution for

the disestablished church, according to which the church is to be governed by a general synod, composed of a house of bishops and a house of clerical and lay delegates, meeting annually in Dublin. The house of bishops has the right of veto, but seven members must agree upon it to render it valid. The bishops are chosen by the diocesan convention, but if the convention fail to elect a candidate to a vacant see by a majority of two-thirds of each order, the election falls to the house of bishops. The primate or archbishop of Armagh is elected by the house of bishops from their own order. The property of the church is vested in a permanent representative body, composed of three classes—the *ex-officio* archbishop and bishops, one clerical and two lay representatives for each diocese, and the co-opted members chosen by the *ex-officio* and representative members, and equal in number to the dioceses. One-third of the elected members retire by rotation. The first convention adopted resolutions against the ritualistic practices introduced into the church of England. In 1873 the number of benefices was 1548, of curates 622. The population connected with the church of Ireland, by the census of 1861, was 693,357 or 11.9 per cent of the whole population; in 1871, 683,295 or 10 per cent. As soon as the Irish act passed the temporalities commission took charge of all the property which had belonged to the established church, and sent out forms to be filled up by clergymen and others who had claims for a continuance of income. The whole number who had commuted at the end of 1873 was 6,162. The amount paid for claims up to Feb., 1873, was £8,239,673.

IRELAND, WILLIAM HENRY, 1777-1835; b. London, son of Samuel, an English engraver and author; was educated in France, and apprenticed to a conveyancer. Visiting with his father, 1795, Stratford-upon-Avon, he forged a lease or deed pretending it to be the autograph of the poet, which he said he had found among some old law papers. He perpetrated other forgeries, and produced the plays of *Vortigern* and *Henry the Second* as the plays of Shakespeare, which deceived many literary men. *Vortigern* was acted at Drury Lane theater, and both were published, 1799. He confessed the forgeries, abandoned his profession, and spent the remainder of his life in more reputable pursuits. He wrote several novels, plays, poems, etc. His *Confessions*, 1805, contain an account of all his forgeries.

IRELAND—LAND LEAGUE. The year 1879 was memorable in the history of Ireland for having witnessed the beginning of a condition of public distress which eventually assumed the proportions of a famine, and for having seen, based upon this condition, the first movements of the popular disturbances of the following year. The poor harvests of 1879 having rendered it impracticable for the tenantry of Ireland to fulfill their rigorous rental obligations, demands were made upon the landlords for reduction of rent, and public meetings to this end were held in various parts of the country, besides an immense gathering in Hyde park, London, the largest ever held in that place, which was attended by more than 100,000 persons. In Oct. the National Irish Land League was organized by Charles Stewart Parnell, a prominent agitator, who was made its first president. This organization was established to procure a reduction of rents through constant agitation in the first instance; to emphasize and enforce a general refusal to pay rent, if this demand were not complied with; and, finally, to bring about a radical change in the existing system of English land-laws, by which the relation of landlord and tenant should be abolished and in its place established a class of peasant proprietors. The various speakers who devoted themselves to advocating the new scheme were violent and even seditious in their utterances, and three of these—James Bryce Killen, Michael Davitt, and James Daly, proprietor of the *Mayo Telegraph*—were arrested on a charge of having used seditious language at a public meeting held Nov. 2, 1879, at Gurteen, co. Sligo. Meanwhile the distress in the country increased, and during the winter and spring of 1879-80 a condition of famine spread throughout the western part of Ireland, where the most appalling scenes were every day occurrences. Organized efforts for relief were made in England under the direction of the Duchess of Marlborough; and in the United States heavy subscriptions were collected, and large sums of money expended in breadstuffs and provisions, which were sent to the starving Irish. In the height of the generous excitement Mr. Parnell visited America, and traveled over the country, speaking in the principal cities and towns in the interest of the Land League. This movement aroused considerable opposition and ill-feeling, which was emphasized by the course of the *New York Herald*, whose proprietor, after causing his journal to oppose the political enterprise of Mr. Parnell, started a subscription for the suffering Irish, heading the list with the sum of \$100,000. Subscriptions poured in to the "*Herald*" fund with extraordinary liberality, and in a few weeks the amount subscribed reached the sum of half a million dollars, which was placed in the hands of a committee of gentlemen in England and Ireland, and by them distributed. The visit of the U. S. frigate *Constellation* to Ireland, loaded with grain and provisions, the gift of American citizens, was also an incident of this exciting period. The suffering in Ireland was greatly reduced by this timely aid, but the incendiary speeches of the Land Leaguers continued to excite public feeling, and agrarian outbreaks began to occur in different parts of the country. The assassination of the earl of Mayo and other landlords by their exasperated tenants added fuel to the flames, and by the close of the year (1880) it was generally conceded that no landlord's life was safe, if he

remained on his estates in Ireland, unless he acceded to the demands of his tenants. But by this time these had grown bolder—mainly through the instigation of the Land League—and whereas before they had been satisfied with a reduction of rent, they now clamored for proprietorship. So serious had the situation become, and so much were English statesmen and politicians impressed with the necessity for radical action, that plans for buying up the English proprietorship in Ireland and distributing it among the native farm-tenants were seriously recommended to parliament, and taken into consideration by some of the leading minds in England. The British government, alarmed at the state of affairs, dispatched troops to the disturbed districts, and announced the policy of first restoring law and order before entering on measures of relief.

IRIDOSMINE, a mineral alloy of iridium and osmium. It has a steel-gray color and metallic luster, and occurs in flattened grains about the size of a small pin-head. It is also found as a heavy gray powder. Its hardness is about equal to that of quartz, and its density ranges from 19.2 to 21.12. It is usually associated with platinum and with gold, bearing a small percentage to the latter. According to Dr. Torrey, the earlier assays at the assay office in New York yielded rather less than 1 oz. to \$1,000,000 of gold, but this increased to 7 or 8 oz., and again diminished. The chief use of iridosmine is in tipping the nibs of gold pens.

IRISITE, a resinoid substance which is the principal constituent of the asphaltic mineral *grahamite*, which has been used successfully in making pavements (see **PAVEMENT**); also for gas-making. It was originally investigated by prof. Henry Wurtz. Grahamite is found in vertical fissures in horizontal rocks in Ritchie co., W. Va., and also at a place about 100 m. w. of Denver, Col. The mean of analyses of grahamite by prof. Wurtz gives: carbon, 78.66; hydrogen, 8.57; oxygen, 12.77; density, 1.145. The other ingredient of grahamite is viscosite (q.v.). Grahamite is black, and has a variable luster; is fusible under pressure, because of the viscosite constituent. It is very soluble in chloroform, benzole, bisulphide of carbon, and warm oil of turpentine. The viscosite is dissolved out of the grahamite by sulphuric ether or light petroleum naphtha. Irisite may be obtained from the residue by means of one of the grahamite solvents above mentioned, filtering and evaporating. When pure it is black, very brilliant, and infusible without decomposition. When its solutions are spread in thin films upon smooth surfaces, the most gorgeous rainbow hues are produced. If a mineral acid be added to a solution of irisite, the latter substance will coagulate, after which it is insoluble in all its former solvents, it having undergone a remarkable change. Analogous to grahamite is the mineral abutite, found in the province of New Brunswick, which also contains a small quantity of irisite and viscosite.

IRNERIUS, or **GARNIA**, b. Italy, 11th c.; was professor of Roman law in the university of Bologna.

IRON (*ante*). The processes of converting the ore into metallic iron are of two kinds—direct and indirect. In the direct process the ore is converted by one operation or a few operations, into wrought iron. This method, employed by the ancients, is still used in some parts of the world, as in India and Central Asia, Africa, and South America. With some modifications and improvements it is practiced also in Europe and the United States, and yields the best iron, but at a greater expense than by the indirect process, which consists in first making pig-iron by smelting the ore in a blast-furnace with fluxes, by which means the metal is more readily obtained, and then reducing the product by puddling and other processes, or by certain manipulations converting the pig-iron into cast-steel.

The following table, taken with the preceding from the annual report of the secretary of the American Iron and Steel Association, presented May 20, 1880, shows in tons of 2,000 lbs. the production of all kinds of iron and steel in the United States from 1872 to 1879:

IMPORTS OF PRINCIPAL IRON AND STEEL PRODUCTS FROM ALL COUNTRIES INTO THE UNITED STATES FROM 1871 TO END OF FIRST QUARTER OF 1880.

SORTS.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1st qr. 1880.
Pig-iron.....	245,553	295,967	154,708	61,165	66,457	83,072	66,871	74,484	316,672	179,491
Bar-iron.....	122,565	89,576	62,253	26,876	24,591	26,652	30,478	33,346	48,840	43,590
Iron rails.....	566,202	381,064	99,309	7,796	1,942	287	...	...	19,090	16,230
Steel rails.....	till now as iron.	149,786	159,571	100,515	16,316	....	35	10	25,057	13,457
Old and scrap iron.....	220,340	278,257	108,838	40,746	25,856	14,149	10,903	6,225	248,429	154,738
Band, hoop, and scroll.....	13,098	12,379	8,245	1,422	328	144	171	7	1,091	1,807
Sheet-iron.....	12,047	10,149	10,713	6,741	3,616	1,758	1,183	838	5,459	3,688
Anchors, cables, and chains...	5,434	5,875	4,668	3,219	2,004	1,863	1,073	646	892	607
Boiler-iron.....	322	684	461	53	46	15	2	1	91	106
Castings.....	441	407	262	74	23	35	53	69	61	20
Total.....	1,185,984	1,234,144	608,923	248,607	141,079	127,975	110,769	115,636	689,622	413,734

The following is the foreign value of iron and steel manufactures (tin-plate excluded) imported into the United States during the time specified: 1871, \$47,919,926; 1872, \$61,-724,227; 1873, \$45,764,670; 1874, \$24,594,534; 1875, \$15,264,216; 1876, \$10,584,126; 1877, \$9,195,368; 1878, \$8,943,043; 1879, \$20,103,101; three months of 1880, \$13,031,674.

SORTS.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Pig-iron	2,854,558	2,868,278	2,689,413	2,266,581	2,093,236	2,314,585	2,577,361	3,070,875
Rolled iron, nails and rails.	1,847,922	1,837,430	1,694,616	1,599,516	1,509,269	1,476,759	1,555,576	2,047,484
Rolled iron, excluding rails.	941,992	1,076,368	1,110,147	1,097,867	1,042,101	1,144,219	1,222,686	1,627,324
Bessemer steel rails	94,070	129,015	144,944	298,863	412,461	432,169	550,398	683,964
Open hearth steel rails.....							9,397	9,149
Iron and all other rails.....	905,930	761,062	584,469	501,649	467,168	232,540	222,890	430,160
Rails of all kinds	1,000,000	896,077	729,413	792,512	879,629	764,709	882,685	1,113,273
Keys of cut nails, included in rolled iron	4,065,322	4,024,764	4,912,180	4,726,881	4,157,814	4,828,918	4,396,120	5,011,021
Crucible cast-steel.....	29,260	24,786	36,328	39,401	39,282	40,430	42,906	56,780
Siemens-Martin or open hearth steel.....	3,000	3,500	7,000	9,050	24,490	25,031	36,126	56,290
All other steel, except Bes- semer	7,740	13,714	6,353	12,607	10,306	11,924	8,556	5,464
Bessemer steel ingots.....	120,108	170,650	191,933	375,516	525,996	560,587	732,226	928,972
Blooms from iron and pig ore	58,000	62,564	61,670	49,243	44,628	47,300	50,045	62,353
Spiegeleisen included in pig- iron.....	.....	.....	.....	7,832	6,616	8,845	10,674	13,931

IRON, a co. in s.e. Missouri; bounded n.e. by Iron mountain and Pilot Knob; 500 sq.m.; pop. '70, 6,278. It is mountainous, and has extensive forests of oak, pine, walnut, etc. Iron ore is abundant, and gold, lead, nickel, and other metals are found. The staple products are grain and wool. The St. Louis and Iron Mountain railroad passes through it. Pilot Knob is in this county, a conical hill 1500 ft. above the sea, and 560 ft. above the plain.

IRON, a co. in s. Utah, extending through the state from e. to w.; intersected in the e. by the Colorado; 9,200 sq.m.; pop. '80, 4,013. The Wasatch mountains cross it in the west. The staple is wool; but wheat, maize, hay, and potatoes are produced. Much of this county is covered with arid plains, and requires irrigation. It abounds in iron and other minerals. Capital, Parowan.

IRON-CLAD OATH, an oath of allegiance prescribed by statute of the United States, for those taking office under the national or state governments, in accordance with the provisions of the 14th amendment to the constitution. The oath as administered reads as follows:

"I, ———, residing at ———, do solemnly swear that I have never voluntarily borne arms against the United States since I have been a citizen thereof; that I have voluntarily given no aid, countenance, counsel, or encouragement to persons engaged in armed hostility thereto; that I have neither sought, nor accepted, nor attempted to exercise the functions of any office whatever under any authority or pretended authority in hostility to the United States; that I have not yielded a voluntary support to any pretended government, authority, power, or constitution within the United States, hostile or inimical thereto. And I do further swear that, to the best of my knowledge and ability, I will support and defend the constitution of the United States against all enemies, foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion; and that I will well and faithfully discharge the duties of the office on which I am about to enter. So help me God."

Sworn to before me, this — day of ———, 188—. }

U. S. Commissioner.

This oath is still administered to officers under the U. S. government, but its application has been restricted by special acts of congress, relieving, in certain instances, classes and individuals from the effect of its provisions.

IRON-CLAD SHIPS. See ARMOR PLATES, *ante*.

IRON MOUNTAIN, a famous deposit of iron ore in Washington co., Mo., 40 m. s.w. of St. Genevieve, on the Mississippi, and connected with St. Louis by railroads. The ore is rich and pure. It is magnetic, having distinct polarity, and in some place, acts strongly on the needle. The main body of the ore has a thickness of 50 ft.; its depth is unknown, but the amount is immense. In 1871 262,477 tons, and in 1872 371,474 tons were shipped by the Iron Mountain company. The deposit has been fully described by Dr. Litton in the second annual report of the geological survey of Missouri, 1855, and by prof. Raphael Pumpelly and Dr. Adolph Schmidt.

IRONS, WILLIAM JOSIAH, b. England, 1812; graduated at Oxford; was made prebendary of St. Paul's, London, 1860; and chosen Bampton lecturer, 1870. He is the author of several valuable theological treatises.

IRONTON, a city of Lawrence co., Ohio, on the Ohio river, 142 m. above Cincinnati and 100 s.e. of Columbus; pop. '70, 5,686. It is on a plain at the base of lofty hills, which contain iron ore and bituminous coal. It is the terminus of the Iron railroad, 13 m. long. It has 10 churches, 2 national banks, a high school, 5 weekly newspapers, a large number of furnaces, rolling-mills, iron-foundries, and machine-shops. The chief article of export is iron, the iron trade amounting to \$7,000,000 a year. The city is lighted with gas, and furnished with water by the Holly works.

IROQUOIS (*ante*), or SIX NATIONS, a confederacy originally consisting of the five tribes, Mohawks, Oneidas, Ononagas, Cayugas, and Senecas, to whom in 1712 were added the Tuscaroras. The league was then called the Six Nations. They inhabited the central and western part of New York, and numbered about 15,000. Each tribe was divided into families, and governed by sachems, but all matters of common interest were settled in a general meeting of all the sachems of the confederacy. They were the most powerful, enterprising, and intelligent of all the Indian tribes. They encouraged other nations to join them, and in the early part of the 17th c. had conquered all the neighboring tribes. They were alternately at war and in alliance with the Dutch, French, and English. In the war of the revolution they took sides with the English under the brave leaders Irant of the Mohawks and Red Jacket of the Senecas, destroying with fire and sword several white settlements. After the war, treaties were made at different times for the cession of their lands, until, 1796, the Indian title was extinguished to the whole region from lake Champlain to the St. Lawrence, and most of the Iroquois emigrated to other places. The Mohawks settled on Grand river, Ontario, Canada, numbering now 2,000. Some from the Tuscaroras and other tribes joined them. In 1820 some of the Oneidas settled on a reservation in Green Bay, Wis., and some of the Senecas in Indian territory. Some of the Oneidas and Senecas removed in 1820 to Canada. The Cayugas in 1795 sold their lands in New York, and joined other tribes with whom they intermarried, a few living together at the Cattaraugus reservation in Erie, near Buffalo. In 1855 the Iroquois group in New York, Wisconsin, Arkansas, and Missouri numbered about 6,000. The languages of the Iroquois, though in grammar and vocabulary related, are distinct. Most of the Protestant denominations have had missions among the Six Nations from the beginning of the century. *The Book of Common Prayer* has been printed in Mohawk, and portions of the Bible in Mohawk and Seneca. The principal works on the Iroquois published are *Cusick's Sketches of the History of the Six Nations*, 1826; *Colden's History of the Five Nations*, 1727 and 1755; *Schoolcraft's Notes on the Iroquois*, 1846; *Stone's Life of Brant*, 2 vols., and *Life of Red Jacket*, 1841.

IROQUOIS, an eastern co. of Illinois, bordering on Indiana, intersected by the Iroquois river, and partly drained by the Kankakee river; 1100 sq.m.; pop. '70, 25,782. It is traversed by the Chicago division of the Illinois Central, Toledo, Peoria, and Warsaw, and Chicago, Danville, and Vincennes railroads. Capital, Watseka. The surface is level, mostly prairie. The soil is generally fertile. The staple products are oats, maize, hay, cattle, and pork.

IRRIGATION (*ante*). Some of the ancient works for irrigation were stupendous. The canal of the Pharaohs, which connected Pelusium with the Red sea, was an irrigating canal. There existed a work in Arabia, probably long before the time of Solomon, which, in some respects, excelled all works of the kind, modern or ancient, and corresponds well with the fact that the Arabians were among the first mathematicians. In Yemen, Arabia, there was an immense reservoir for holding water for irrigating the valley of Mareb. This reservoir was made by a dam 2 m. long and 120 ft. high. It was constructed of immense blocks of ashlar, and was so durable as to serve the purpose for which it was built more than 2,000 years. It then gave way, scattering ruin in the course of the torrent which it let loose. It must be borne in mind that one of the best examples of modern engineering is a dam in France across the Furens which is 164 ft. high, but only 328 ft. wide at the top. This work almost sinks into insignificance when compared to the ancient Arabian dam. It may, perhaps, be presumed that there is some exaggeration in the statement regarding the ancient work, but a reasonable allowance must leave it as one of the most stupendous engineering works of which we have any record. The plains of Assyria and Babylonia were intersected with a system of canals both for irrigation and navigation. In many of them the water was raised by mechanical means somewhat like that practiced at present in Egypt. The ancient Peruvians and Mexicans constructed immense aqueducts for irrigation purposes. The system of irrigation practiced in Lombardy at the present time, and derived from the ancient Romans, is the cause of the wonderful fertility of that country. The distribution of the waters of all the rivers of Lombardy is held by the government, and is rented for periods of time to the horticulturists and agriculturists. Channels are made for leading the water from the rivers, and from these secondary channels are constructed, about 24 ft. apart. In summer the water is allowed to flow only a few hours during each week, but from Oct. to April the flow is steadily kept up, except during grass-cutting. The lands thus irrigated well repay their owners for the outlay by the increased rent received, which is about one third more, while the yield is double. The cultivation of rice can be successfully carried on only with irrigation, and the best lands are therefore found on the alluvial flats bordering rivers. The land is intersected by ditches, along which

there are embankments supplied with gates, so that the water in the ditches may be raised above the level of the fields, and flowed upon them at pleasure. The rice is planted in trenches and lightly covered, and then the water is let on and kept there for from 4 to 6 days, or when the grains swell and begin to sprout. It is then let off till the sprouts are 2 or 3 in. above the ground, when it is let on again for about the same space of time. Then it is drained off, and after a time the rice is cultivated with a hoe. In from 6 to 8 weeks the water is again let on for 2 weeks, for the first 4 days to a considerable depth, after which it is gradually let off. See RICE. Considerable attention is paid to irrigation in our western territories and California. The facilities are usually great, as elevated mountain streams may generally be used as sources, whence the water finds its way by gravity wherever it is directed.

IRRITANTS. Those medicines which when applied to the skin or mucous membranes produce irritation are commonly called irritants. The term has been sometimes vaguely applied to medicines which produce irritation of nerves in distant parts when taken internally, as instanced in the action of strychnine upon the spinal cord, but such use is confusing; the better term to apply to strychnine is that of nervous stimulant. In one sense, however, irritants are nervous stimulants, because they act upon the nerves, and when these are paralyzed or divided the irritants lose their power. There is diversity in the action of irritants. Most mineral or miner-acid irritants cause disorganization, as corrosive sublimate, nitrate of silver, caustic potash and soda, also sulphuric, nitric, hydrochloric acids; but these agents are called also caustics. It would perhaps be more proper to apply the term irritant to such substances as create irritation without acting chemically, although disorganization or death of the parts might follow their continued application. The imponderable agents are irritants. Heat is an irritant, and may be considered as a mechanical or kinetic irritant. Light is also an irritant to the retina, and in diseases of the eye is often a powerful one. Electricity is an irritant when applied in certain forms, but may be used as a mild stimulant, just as heat may be employed to disorganize and to excite excessively, or to irritate or to gently stimulate.

IRVINE, WILLIAM; 1742-1804; b. Ireland; d. Philadelphia. He graduated at the Dublin university, was surgeon of an English ship of war in the English and French war, at the close of which, 1763, he emigrated to America, settling at Carlisle, Penn. In the revolution he joined the colonies, and was appointed by congress colonel of the 6th Pennsylvanian regiment. At the battle of Three Rivers, Canada, he was made prisoner, but exchanged May, 1778. He was made brig.gen. May 12, 1779. In 1781-83 he had command at fort Pitt of the troops for the defense of the western frontier, and 1785 was appointed for the state an agent to examine the public lands and devise a mode for their distribution to the soldiers. In 1787 he was made a member of the old congress, and of the convention to revise the constitution of Pennsylvania. In 1794 he was member of congress, and was appointed to the command of the troops to suppress the "whisky rebellion." He was president of the society of the Cincinnati.

IRVING, PETER, 1771-1838; b. N. Y., brother of Washington. He studied but did not practice medicine. In 1802 he was editor and proprietor of the *Morning Chronicle*, a Democratic journal which advocated the election of Aaron Burr to the presidency. He was associated with his brother in the publication of *Knickerbocker's History of New York*. He resided in Europe, 1809-36.

IRVING, THEODORE, LL.D.; b. N. Y., 1809; graduated at Columbia college, 1837; visited Europe, 1828; and in Madrid, Paris, and London attended lectures and studied literature. He studied law in London and New York. In 1836-49 he was professor of history and belles-lettres in Geneva college, N. Y., and subsequently for 3 years was professor of belles-lettres in the Free academy of New York. In 1854 he was ordained a minister of the Episcopal church; became rector of St. Andrew's parish, Richmond, Staten island, and, 1874, rector of St. John's school for young ladies in New York. He published *The Conquest of Florida by De Soto*, and *The Fountain of Living Waters*, a devotional work.

IRVING, WILLIAM, 1766-1821; b. N. Y., brother of Washington. He was an Indian trader on the Mohawk river, 1787-91; and in 1793 a merchant in New York. In that year he married a sister of James K. Paulding, and was associated with him and Washington Irving in the publication of *Salmagundi*, contributing to it most of the poetical articles. He was a member of congress 1813-19, but resigned on account of ill health.

IRWIN, a co. in s. Georgia, bounded n.e. by the Oemulgee, and intersected by the Allapaha; 850 sq.m.; pop. '80, 2,696. It is level and sandy, and extensively covered with pine forests. It produces some oats and maize. Capital, Irwinville.

IRWIN, JARED, 1751-1818; b. Mecklenburg co., N. C.; at an early age removed with his parents to Georgia. In the revolution he was active against the Tories and the Indians. After the war he was chosen to the state legislature, was a member of the convention which adopted the constitution in 1789, president of the state constitutional convention of 1798, president for many years of the senate, and governor of Georgia, 1796-98 and 1806-9. Removing to Pennsylvania, he was member of congress from that state, 1813-17.

ISAAC (*ante*) was distinguished for obedience to his father, combined with resignation to the will of God. These traits of character were conspicuous in his quiet submission to being bound upon the altar. This event has had various explanations, and its account has been viewed in different lights. It has been denied that it was a divine voice which called for the sacrifice. The usual view, however, holds to the obvious meaning of the narrative. Among different explanations in this view, may be noted the following, which reads this history in the light which the completed Scriptures throw backward upon it. It was needful that Abraham, as the father of the faithful, should exercise such trust in God as would make him, in that day of darkness and idolatry, the founder of a godly line and an example to believers even in distant times. It was therefore requisite that he should have his knowledge of God's plans increased in order that it might furnish a foundation for great and conspicuous faith. This was done chiefly by means of the land in which he sojourned, and of Isaac his son. The promise that the land should be given to his descendants was one of the first stones of the foundation on which his faith was built; to this was added the assurance that a son should be born to him in his old age. When, 25 years after his entrance into Canaan, this second promise was fulfilled, the living son, the heir of the promises, became the means of a great increase to Abraham's knowledge, and confirmation of his faith. He was taught not only that Isaac represented the Messiah, the Divine deliverer, who was to descend from him, but also that the Messiah by offering up himself unto death would make atonement for the sins of men. Therefore his offering of Isaac was demanded, and made actual through all its stages to the moment when his life was on the point of being taken; and was then completed by the substitution of the victim which Abraham was directed to slay instead of his son. Thus Isaac manifested a Christlike obedience and submission even unto death; while the actual death inflicted on the other victim represented the completion of the sacrifice to which his greater son would deliver himself up. Abraham's own experience also was made representative of God's great sacrifice in salvation. He went through all the anguish that a father's heart could experience in inflicting death on a beloved son without actually striking the final blow; and even this he had so fully intended to strike, and had come so near striking it, that he must have passed through almost all the bitterness of which his soul was capable. Thus was he taught, as fully as possible before the event, the feelings of Christ and of the Father which have since been indicated by the Scripture words, "Father, if it be possible, let this cup pass from me;" "My God, why hast thou forsaken me;" "God spared not his own Son, but delivered him up for us all." In this way also Abraham was brought to exercise faith concerning the resurrection of the dead, as completely as was possible before the actual resurrection of Christ; so that the New Testament says of Abraham that he offered up his son on whom the promises rested, "accounting that God was able to raise him up even from the dead; whence also he received him in a figure. It is probable that no single view likely to be reached by modern thought solves all the mystery or presents all the Divine truth involved in this scene from a remote antiquity."

Isaac's love for his wife, prominent in the scriptural record, is obscured by only one act, in which evidently he was betrayed into cowardly selfishness in persuading his wife to deny the conjugal relationship between them, because, as he afterwards acknowledged, he said, "Lest I die for her." Yet this great fault of his life is hardly to be regarded as a betrayal of a real character which had been habitually concealed, but rather as an exceptional overwhelming of his better nature by the power of ungovernable fear. In this respect he may have resembled his father, who sinned twice in the same way, yet not in accordance with his usual character, but in glaring contrast to it. In his youth Isaac was thoughtful, in manhood increasingly reflective, and through all his life prayerful and devout. In his treatment of his children he was unwisely partial; and as, while he preferred one son, Rebecca favored the other, it is probable that they both promoted that alienation between the brothers which afterwards so unhappily increased. In disposition he was peaceful and forbearing, preferring to suffer wrong rather than contend violently for his rights. In business relations he was upright; in agriculture he was successful, and became exceeding rich in servants, flocks, and herds. In old age he was disquieted with bodily infirmity and domestic grief. He died full of days, and is one of those concerning whom the certain revelation has been put on record that he has a place in the kingdom of heaven.

ISAAC II., ANGELUS; 1154-1204; a Byzantine emperor. Delivered by a popular revolution from death, to which he had been condemned by his kinsman, Andronicus Comnenus, emperor of Constantinople, he obtained the throne, 1185. His vices and incapacity rendered him unpopular, and he was dethroned by his brother, Alexis III., 1195. and deprived of his sight, but restored by the crusaders who took Constantinople, 1203. He was again dethroned by Alexis Ducas, and put to death.

ISAAC, LEVITA, a distinguished Jewish rabbi, b. at Wetzlar, Germany, 1515. He joined the Roman Catholic church with his son, 1546. He was professor of Hebrew and Chaldee at Louvain, and in 1551 at Cologne. He was the author of several learned grammatical works, and also translations. His name after his conversion was John Isaac Levi. The date of his death is unknown.

ISABELLA, a central co. of Michigan, intersected by the Chippewa river; 576 sq. m.; pop. '70, 4,113. The surface is generally level, and largely covered with forests of pine and sugar-maple. Productions: wheat, oats, maize, hay, and potatoes. The Flint and Père Marquette railroad passes through the n.e. part. Capital, Mt. Pleasant.

ISABELLA OF ENGLAND. See EDWARD II. and III., *ante*.

ISABEY, JEAN BAPTISTE, 1767-1855; b. France. He was a pupil of the celebrated painter David, and began his profession by making crayon portraits, but devoted most of his life to miniature-painting, in which he became very eminent. His picture of Napoleon, 1802, reviewing his troops, gained for him great renown, and he became the emperor's miniature-painter. The members of the imperial family, the marshals and other dignitaries of the empire, sat to him, and he was invited to visit Alexander of Russia. His *Tableaux des Maréchaux* and the *Conference of Vienna* are fine large historical paintings.

ISÆUS, b. probably at Chalcis, though claimed by Athens. The dates of his birth and death are unknown, though it is certain that he became eminent as an orator the last half of the 4th c. B.C. He was the son of Diagoras. In his youth he was at one time dissipated and extravagant, but afterwards reformed. He went when young to Athens, studied oratory under Lysias and Isocrates, and taught with success a school of rhetoric of which Demosthenes was a pupil. He was the fifth in order of the 10 Attic orators, and is mentioned by Plutarch, in his *Lives of the Ten Orators*, as the author of 64 orations. Only 11 are extant. They are all forensic, and treat mostly of subjects relating to disputed wills. His style, though elegant and vigorous, lacks the perspicuity and simplicity of his master Lysias. An English translation by sir William Jones was published in London in 1794, with a commentary and notes critical and historical.

ISAIAH, PROPHECY of (*ante*). The reasons alleged by some critics, within this century, for denying that Isaiah wrote the last 27 chapters of the book called by his name are: 1. As, according to a tradition mentioned in the Talmud, the order in which the three great prophets were arranged was originally Jeremiah, Ezekiel, and Isaiah, it is to be inferred that Isaiah was placed last because of a suspicion which somewhere existed that the latter part had been written after Ezekiel. To this it is answered that the inference would not be warranted even if the alleged order of arrangement were certain; but that it is not certain or probable is shown by a witness earlier than the Talmud, that is, the author of Ecclesiasticks, who refers to the three prophets in the order in which they now stand—Isaiah, Jeremiah, and Ezekiel. 2. The writings of the prophets who lived after Isaiah, and before the captivity, do not show an acquaintance with the second part of the prophecy. To this it is answered: (1) that the fact would not prove the non-existence of the second part when these prophets wrote; and (2) that in fact, as will hereafter be more fully shown, Jeremiah and other prophets of the time specified, do quote this second part (yet the objector insists that, on the contrary, it contains quotations from them). 3. The last part differs from the first in style and religious views. To this, other critics reply that no differences exist which are inconsistent with unity of authorship; that the first part contains the germs of the principal things exhibited in the second; and that the style of the latter part greatly resembles that of the former, although it naturally rises in fullness and sublimity as the scope of the prophecy is enlarged. 4. Isaiah lived more than a century before the captivity in Babylon, and did not once foretell it; but as the author of the second part narrated so fully the special condition of the Jews at that time, and the general oriental relations, even calling Cyrus by name, he must have been an eye-witness of what he described. The answers to this are: (1) This reasoning, which is simply the assumption that absolute prediction is impossible, will appear without force to those who take notice that the prophet ascribes all the predictions which he records to God as their author, who claims the prerogative of foretelling the future, and exercises it in regard to Cyrus, Babylon, and the Jews, for the express purpose of revealing himself to those who did not know him. (2) If the reason alleged proved that the second part of the prophecy was written after, or at, the captivity, it would equally prove that it was written after, or at, the coming and crucifixion of Jesus Christ; for these events are described in it as clearly as is the deliverance of the Jews by Cyrus. (3) In the first part of the prophecy Isaiah does foretell the captivity in Babylon. In chapter i. he promises a restoration and redemption which admit of a primary reference to the return from captivity; in vi. he speaks of a time when the cities of Judah would be wasted without inhabitant, the houses be without man, the land be desolate, and the men be removed far away; xxxix., he tells Hezekiah: "Behold, the days come, that all that is in thy house, and that which thy fathers have laid up in store until this day, shall be carried to Babylon: nothing shall be left;" xlii., xlv., he foretells that the Lord would stir up the Medes against Babylon, would set Israel in their own land, and that in the day of their deliverance they should say concerning Babylon: "How hath the oppressor ceased, the golden city ceased!"

PROOFS THAT THE LAST 27 CHAPTERS WERE WRITTEN BY ISAIAH.—I. *External*.—1. There is evidence that several of the prophets who wrote before the Jewish captivity were familiar with this part of Isaiah, alluded to it and quoted it. While the full force of this evidence can be felt only after a careful comparison of many passages in the original language, part of it can be at once appreciated. Isaiah lii. 1, 7 says: "There

shall no more come into thee the uncircumcised and the unclean. How beautiful upon the mountains are the feet of him that bringeth good tidings, that publisheth peace;" and Nahum, who wrote about 660 B.C., says: "Behold upon the mountains the feet of him that bringeth good tidings, that publisheth peace. O Judah, the wicked shall no more pass through thee." Isaiah xlvii. 8 says to Babylon: "Thou that art given to pleasures, that dwellest carelessly; that sayest in thine heart, I am, and none else beside me;" and Zephaniah, about 625 B.C., applies the same language to Nineveh: "This is the rejoicing city that dwelt carelessly, that said in her heart, I am, and there is none beside me." An examination of the contexts will show, it is believed, that Isaiah is the earlier writer from whom the others quote. Consequently it is plain that the latter part of his prophecy existed long before the captivity. 2. The book of Ezra and the second book of Chronicles give the decree of Cyrus liberating the Jews, in which he says: "All the kingdoms of the earth hath the Lord God of heaven given me, and he hath charged me to build him a house in Jerusalem." On the supposition that Daniel and other Jews had at Babylon the book of Isaiah containing these last chapters, the action of Cyrus, on being made acquainted with their declarations concerning himself, was simply that which an intelligent and upright man would naturally feel stirred up to perform. But on the supposition that the book contained only the first 39 chapters, then for the great historical facts of the return of the Jews to their own land, of the grant to them of royal treasures for rebuilding their temple, and of the conqueror's official acknowledgment of obligation to God, whom he had not known, no sufficient reason is assigned. 3. The book of Isaiah as it stands in the Hebrew canon has 66 chapters. If it had, at first, contained only 39, an addition of 27 chapters of any sort, and especially of the 27 now forming the latter part, could not have been made to it, at any subsequent time, without some record, or proof, or intimation remaining concerning the agent, author, process, or time. But in this case nothing of the kind has ever been seen or heard of. 4. The book of Ecclesiasticus, written in Hebrew after 300 B.C., in eulogizing the succession of Scripture characters, speaks of Isaiah as "the prophet who was great and faithful in his vision; in his time the sun went backward, and he lengthened the king's life. He saw by an excellent spirit what should come to pass at the last, and he comforted them that mourned in Zion. He showed what should come to pass forever, and secret things ere ever they came." This description, affirming Isaiah's prophetic eminence in Hezekiah's time, speaks chiefly of things contained in the last 27 chapters, and links them firmly with the first part, characterizing the xl. and lxi. when it says: "he comforted them that mourned in Zion;" the xlii. when it speaks of "showing secret things ere ever they came;" and the close of the book, when it points to things that "should come to pass forever." This short passage, therefore, shows that the writer of Ecclesiasticus had the book of Isaiah in its integrity as we have it now. 5. In the Septuagint translation of the Old Testament, made about 250 B.C., the book of Isaiah consists of 66 chapters. At that time, therefore, the whole book must have been in circulation as it is now. 6. When the Savior went into the synagogue at Nazareth there was delivered to him "the book of the prophet Esaias," and, having opened it, he found the place where it was written: "The Spirit of the Lord is upon me, because he hath anointed me to preach the gospel to the poor." This passage is part of the lxi. chapter. When the treasurer of Candace was returning from Jerusalem he read in his chariot Esaias the prophet; and the passage that he asked Philip to expound—"He was led as a sheep to the slaughter"—is in the liii. chapter. Paul, in Romans, affirms "Esaias saith, 'Lord, who hath believed our report?'" This also is part of the liii. chapter. Again he declares: "Esaias is very bold, and saith, 'I was found of them that sought me not. . . . All day long I have stretched out my hands to a disobedient and gainsaying people.'" This is in the lxxv. chapter. From the New Testament, therefore, it is plain that the book of Isaiah at the time of Christ contained these 27 chapters as it contains them now.

II. *Internal.*—Two items only of the internal proof that Isaiah was the author of the whole book can here be given. 1. The first chapter is an introduction, not merely to the first part, but to the whole book, and in its closing verses bears a marked resemblance to the last 27 chapters. After its condemnation of Judah and Jerusalem for their sins, it promises a future purification and redemption, and ends with declaring that incorrigible sinners shall be destroyed. "Zion shall be redeemed with judgment, and her converts with righteousness. And the destruction of the transgressors and of the sinners shall be together." The last 27 chapters contain three sections, of 9 chapters each, all promising a future salvation, and all ending with declaring the destruction of the wicked. The first section, referring primarily to deliverance from captivity and idolatry, says: "Go ye forth of Babylon, utter it to the end of the earth, say ye: The Lord hath redeemed his servant Jacob. . . . There is no peace, saith the Lord, to the wicked." The second section, referring especially to a spiritual salvation, says: "Peace, peace to him that is far off, and to him that is near, saith the Lord; and I will heal him. . . . There is no peace, saith my God, to the wicked." The third section promises the new heavens and the new earth, which are to continue forever, and intensifies the declaration of destruction to the wicked. And as the introduction, in the first chapter, closes with declaring that the mighty sinner and his work "shall both burn together, and none shall quench them," so the whole book closes with the dreadful sentence: "Their worm shall not die, neither shall their fire be quenched; and they shall be an abhorring unto all

flesh." 2. Through the book of Isaiah—the first part and the last—there is a series of prophecies concerning the Messiah which demonstrates the unity of the whole. Some of these are the following: in chap. ii. the prediction springs at once to the last days, when the mountain of the Lord's house shall be established in the top of the mountains, and men shall learn war no more; in chap. vii. it promises the birth of a virgin's son, who should be named Immanuel, as a sign of the son of Mary; in the ix. it glorifies the way of the sea, beyond Jordan, Galilee of the nations, and proclaims joyful tidings concerning the child that should be born, one of whose names would be the mighty God, and whose government and peace should increase forever; in the xi. it declares that a rod should come forth out of the stem of Jesse, on whom the Spirit of the Lord should rest; in the xxxii. it announces that there should come a man as a hiding-place from the wind, and a covert from the tempest; in the xxxv. it affirms that the wilderness and the solitary place should be glad, and the ransomed of the Lord return and come to Zion with songs and everlasting joy upon their heads; and in the last 27 chapters it expands all these promises, beginning with the voice of the forerunner in the wilderness, revealing the glory of the suffering Messiah, and foretelling the new heavens and the new earth.

ANALYSIS.—The book contains two prophetic parts with intervening chapters in which history and prophecy are closely combined. *Part I.* contains 35 chapters. Chapter i. is introductory, as has been said, to the whole book; ii.-iv. announce the Messiah's kingdom and judgments on transgressors; v. pronounces condemnation on Israel and Judah under the emblem of a cherished vineyard that yields only evil fruit; vi. records the prophet's vision of the glory of the Lord, and foretells a mingling of judgments and mercy; vii. promises a child, as a sign from the Lord, whose birth would soon be followed by the desolation of the land of the two hostile kings; viii. denounces judgments on Israel and Judah under the emblem of the prophet's son whose name signifies, "Hasten the spoil, rush on the prey;" ix. foretells the birth and the divine nature of the Messiah; x. describes the advancement and defeat of the Assyrians; xi., xii., portray the blessings of the Messiah's kingdom; xiii.-xxiii. contain a series of "burdens," to be borne by Babylon, Philistia, Moab, Damascus and Israel, Ethiopia, Egypt, Assyria and Israel, Egypt and Ethiopia, the desert of the sea, Dumah and Arabia, Jerusalem and Shebna, and Tyre; xxiv.-xxvi. announce judgments and sorrow on account of sin, followed by the blessings and joy of salvation; xxvii. represents the punishment of Assyria and Egypt under the emblems of the leviathan and the dragon of the sea; xxviii.-xxxi. proclaim judgments on Israel and Jerusalem mingled with mercies; xxxii. promises the Messiah under various emblems; xxxiii., xxxiv., foretell judgments on the nations, mingled with mercy to the people of God; xxxv. closes the first part with a glorious prediction of the Messiah. *Intermediate chapters* (xxxvi.-xxxix.) in which history is combined with prophecies that were fulfilled immediately, except that, in mercy to Hezekiah, the captivity threatened was deferred. *Part II.*, consisting of 27 chapters, and comprising prophecies concerning the whole work of redemption from the rebuilding of Jerusalem to the new creation, is subdivided into three sections of 9 chapters each. *Section 1* (chapters xl.-xlviii.), in which both the Messiah and Cyrus are promised as deliverers, with the latter, as first to come, emphatically named and described in the central place. *Section 2* (xlix.-lvii.), promising the Messiah alone, assigns his sufferings, death, and consequent glory the central place. *Section 3* (lviii.-lxi.), exhibiting the glory only of the Messiah, gives the central place to Zion as the bride.

ISAMBERT, FRANÇOIS ANDRÉ, 1792-1857; b. France. He distinguished himself greatly at the bar by his defense of the free colored people of the French West Indies. He assisted in forming the French geographical society, and the society for the abolition of slavery. He was a voluminous writer. Among his works were a *Manual for the Publicist and Statesman*; *The Religious Condition of France and Europe*; *A History of Justinian*; *History of the Origin of Christianity*; a translation of the works of Josephus and of the *Ecclesiastical History* of Eusebius, besides numerous articles contributed to periodicals.

ISANTI, a co. of Minnesota, intersected by the St. Francis or Rum river; 490 sq. m.; pop. '75, 3,901. The surface is diversified with forests and lakes. The soil is fertile, producing wheat, oats, maize, grass, and potatoes. Capital, Cambridge.

ISAURIA, a tract of country in Asia Minor on the n. side of Mt. Taurus between Phrygia, Lycaonia, Cilicia, and Pisidia. The Isaurians were a wild and half barbarous people, living by plunder and rapine, and greatly annoyed the Roman and Byzantine rulers. They have displayed an indomitable spirit from the earliest times. When opposed by superior numbers they fled to their mountain fastnesses. They were equally formidable at sea, and with their Cilician neighbors ravaged the eastern seas with their piracies. In 78 B.C. they were reduced to a temporary submission by the Romans, but soon renewed their raids, keeping their neighbors in constant alarm. The Romans endeavored to surround their country with a chain of fortresses. In the 3d c. they formed one nation with the Cilicians, and one of their number proclaimed himself Roman emperor, but was put to death. In the 8th c. two of their number, Zeno and Leo III., obtained the throne of the eastern empire. The capital, Isaura, at the foot of

Mt. Taurus, the only important city, was a large, rich, and well-fortified place. It was burned, together with its inhabitants, by the Isaurians when unable to withstand the siege of Perdiccas. The country was rocky and barren, producing chiefly the vine, which was cultivated with care.

ISIDORE OF CHARAX, b. at Charax on the Tigris; was a geographer, living in the 1st c. A.D. He wrote a work describing the Romans, Greeks, and Parthians, extracts from which are found in Pliny, and fragments published in modern times give much information concerning Asiatic geography.

ISLA, JOSÉ FRANCISCO DE, 1703-81; b. Spain; a Jesuit preacher and satirist, a man of acute wit and intense humor. He ridiculed a religious festival at Salamanca and a royal pageant at Pampeluna by an ironical eulogy so artfully disguised that at first it was regarded as an honest adulation, but upon its burlesque character becoming known, he was compelled to leave the city. His most important satire was *The Life of the Popular Preacher, Fray Gerundio*, in whose adventures he held up to public contempt the ignorance and audacity of the itinerant friars of the time. It was condemned in 1760 by the inquisition on the clamor of the lower clergy, but his popularity saved him from personal persecution. His poem *Cicero* is rich and pungent in sarcasm. A copy of it was presented to the Boston atheneum in 1844, with some of his autograph letters.

ISLA DE LEON, a narrow island in the Atlantic, s. of Spain, separated from the mainland by the strait of Santi Petri. It is 10 m. long; pop. 10,000. On it are the cities of Cadiz and Isla de Leon. It is fortified, has several convents, 2 hospitals, and an observatory.

ISLA DE NÉGROS, one of the group of islands in the Malay archipelago, known as the Philippines. It is 140 m. long, and averages 25 m. in width, its total area being 3,827 sq.m., with a pop. of 255,827, in scattered Spanish settlements, mostly on the n. shore.

ISLAND, a n.w. co. of Washington territory, comprising the two islands Whidby and Camano, and bordering on the strait of Juan de Fuca; pop. '70, 626. Whidby is 40 m. long, but quite narrow, and noted for its fertility and salubrity. The staple products are grass, barley, wool, and potatoes. The county is partly covered with forests. Capital, Coupeville.

ISLAND POND, a village of Essex co., Vt., on a small lake of the same name; pop. 300. It is on the Grand Trunk railroad, 149 m. from Portland. It has 3 churches, a newspaper, flouring and lumber mills, and a custom-house. It is on the boundary between the United States and Canada.

ISLE LA MOTTE, an island 6 m. long in lake Champlain, forming the township of Isle la Motte, Grand Island co., Vt. It is 30 m. n. of Burlington. Pop. '80, 504.

ISLE OF DOGS. See DOGS, ISLE OF, *ante*.

ISLE OF FRANCE. See MAURITIUS, *ante*.

ISLE OF MAN. See MAN, ISLE OF, *ante*.

ISLE OF WIGHT, ENGLAND. See WIGHT, ISLE OF, *ante*.

ISLE ROYALE, a co. of Michigan, including the island of the same name, together with several smaller islands, in lake Superior, n.w. of Keweenaw point. Isle Royale island, 40 m. long, is extensively covered with trees, and abounds in copper and other minerals. The county is remarkable for the interesting discoveries made of the relics of a prehistoric people to whom the use of copper was known. Some of their excavations, propped up with huge wooden supports, now dropping to decay, show a wonderful knowledge of the art of mining. Their tools were of stone and copper, and many of them are found on the island. Siskwit bay is a small settlement of miners employed in the copper-mines of a New York company. Capital, Minong. Pop. '80, 55.

ISLES OF SHOALS, a cluster of 8 barren rocky islands in the Atlantic ocean off the coast of New Hampshire, 10 m. s.e. of Portsmouth. The two largest are Appledore, containing 400 acres, and Star, 150. On these are large hotels for visitors, who resort there for the sea air, boating, and fishing. A steamer runs daily from Portsmouth. On White island is a revolving light 87 ft. above the sea. These islands are inhabited by a few fishermen.

ISLIP, a village of Suffolk co., Long island, N. Y., 44 m. e. of Brooklyn, is on Great South bay, and on the South Side railroad. It is a summer resort. It has 3 churches, 2 academies, several mills, and a shipyard. Pop. 1500. The total population of the township, containing the large villages of Bay Shore and Sayville, is 5,815.

ISMAELIAH, or ISMAELIANS. See ISMAILIS, *ante*.

ISMAIL PASHA, or ISMAIL I., Viceroy and Khedive of Egypt; b. Cairo, Egypt, 1830; is the second son of Ibrahim Pasha, and grandson of Mehemet Ali. Educated at Paris, on his return to Egypt he was appointed by his uncle Said Pasha to the government of the country during his uncle's absence in Europe, and in 1862 placed in command of the army. On the death of Said Pasha in 1863 he succeeded as the fifth viceroy of Egypt. During the American war of the rebellion he acquired vast wealth by the production of cotton. Regarding the Suez canal of count de Lesseps as

conducting to the power and resources of Egypt, he actively encouraged the enterprise. In 1866 he secured from the sultan the hereditary succession in his line, and in 1867 had conferred upon him the title of khedive. Not satisfied with these privileges he demanded more, threatening to withdraw the troops he had sent against the Cretan insurgents and to seize Crete if his demands were refused. By the advice of foreign powers he recalled his demand. But in 1868-69, by extending his rule over the Upper and White Nile, by making foreign loans for the increase of his army and navy, by proposing the neutralization of the Suez canal and inviting foreign rulers to be present at its opening, he made himself almost an independent sovereign. The sultan commanded him to reduce his army, recall his orders for iron-clads and breech-loaders, and the contraction of foreign loans, threatening him with deposition if he refused. Not receiving expected aid from Russia and other powers, he submitted. Afterwards he received new prerogatives, giving him control of his army, and liberty to make loans and commercial treaties. In 1874 he obtained a victory over the sultan of Darfur, central Africa. By public roads, agriculture, and other methods, he endeavored to civilize the surrounding rude tribes, and introduced many and various public improvements. But in 1879 the governments of France and England, in view of the wretched financial condition of Egypt and the dissatisfaction of the people with the administration, determined to interfere in behalf of good government, and united in demanding of the Porte that the khedive should commit the portfolios of finance and public works to English and French ministers. But the khedive resented any interference of the western powers with Egyptian affairs. The sultan offered to depose Ismail Pasha, and to appoint Halim Pasha, Ismail's uncle, as his successor; but the powers advised the khedive to abdicate, promising to support his son Tefvik. The sultan acquiesced in the course recommended, and, June 26, he signed the firman deposing the khedive in favor of his son, prince Mohammed Tefvik. Ismail at once complied with the demand, and his son was proclaimed khedive as Tefvik I. Ismail received an annual allowance of £50,000, each of his sons Hassan and Hussein £20,000; and his mother £30,000. Ismail Pasha left Egypt June 30, for Naples.

ISNARD, MAXIMIN, 1751-1830; b. France. In 1791 he was a member of the national assembly, in which he distinguished himself for his boldness and eloquence. He was re-elected in 1792. He joined the Girondists, and was arrested in June, 1793, but escaped, concealing himself with a friend until the fall of Robespierre. He appeared again in the assembly, and afterwards was a member of the council of 500. After this he lived in retirement in his native city, engaged in literary and philosophical pursuits.

ISOMERISM (*ante*). Isomeric bodies may be considered as naturally divided into physical isomers and chemical isomers. The physical are more strictly or perfectly isomeric than the chemical, and on account of their similar molecular or radical composition when they are subjected to the action of different forces or reagents exhibit the same behavior. Thus there are several hydrocarbons known as terpenes, having the composition $C_{10}H_{16}$, as the oils of lemon, bergamot, and turpentine, which show the same reactions under the influence of chemical agents, except their difference of odor and action on polarized light. Chemical isomers merely, do not carry their isomerism so far, for although they may have the same proportion of elements, and also the same molecular weight, they do not exhibit the same behavior under reagents. Thus, the molecular formula $C_3H_4O_2$ represents three different bodies which decompose differently when acted upon by caustic alkalis, propionic acid, $C_3H_5O_2.HO$, being converted at common temperatures into propionate of potassium, $C_3H_5O_2.KO$. Acetate of methyl, $C_2H_5O.CH_3O$, is not changed at ordinary temperatures by caustic potash, but when heated with it, acetate of potassium and methylic alcohol are produced. Again, formate of ethyl, $CHO.C_2H_5O$, when heated with caustic potash, is changed into formate of potassium, $CHO.KO$, and ethyl alcohol, $C_2H_5.HO$. These chemical isomers are the metameres mentioned in the preceding article, their behavior depending upon the manner in which organic radicals enter into their composition. See RADICAL, in chemistry. Another class of isomeric bodies are called polymers.

ISOMETRIC PROJECTION (Gr. *ἴσος*, equal, and *μέτρον*, measure), a kind of drawing used by architects and engineers for purposes of construction. It is an orthographic projection in which one plane or projection is employed, and therefore the measurement is without regard to the rules of perspective, the plane of the drawing being supposed to be at an infinite distance from the eye. It is used to delineate structures whose principal lines are parallel to three rectangular axes, and the plane of projection makes equal angles with these axes, which are called co-ordinate axes, and the planes, taken two and two, are called co-ordinate planes. The plane of projection passes through the point of intersection of the three axes, and this point is the center of projection. The projections of the co-ordinate axes are the directing lines of the projection, and form equal angles of 120° with each other.

ISRAEL. See JACOB, *ante*.

ISRAELITES. See JEWS, *ante*.

ISRAFIL', one of the three angels who appeared before Abraham to announce the forthcoming fate of Sodom, and specially designated as the angel of music. According

to the Koran, to Israfil is assigned the duty of sounding the "last trump" on the day of resurrection.

ISSAQUÉNA, a western co. of Mississippi, having the Mississippi river on the w., and the Yazoo and Sunflower on the e.; 600 sq.m.; pop. '70, 6,887. It is watered by the Yazoo and Sunflower rivers. The surface is level, covered with thick forests, and often inundated. The soil is fertile, and produces cotton, maize, and sweet potatoes. Capital, Mayerville.

ISSUE, in law (*ante*). The point in dispute between the parties to a suit may be one either of law or of fact. If the former, it is decided by the court without the intervention of a jury; if the latter, it is determined by a jury, or, in equity practice, by a judge. In some of the states of the union issues of both kinds may by consent of parties be tried by a referee. When a court of law or equity is sitting without a jury, it sometimes happens that a question of fact arises upon which the decision of a jury is desired. A fictitious suit is thereupon framed, involving the point in question, and brought to trial before a jury summoned for the purpose. The verdict rendered being returned to the court, is accepted as a settlement of the issue of fact, and the trial of the cause out of which that issue grew thereupon proceeds. In the state of New York a feigned issue in such cases is not required, the actual question as it arises being submitted to a jury by order of court.

ISTER. See DANUBE, *ante*.

ISTHMUS CANALS. See INTEROCEANIC CANAL.

ISTHMUS OF DARIEN. See DARIEN.

ISTHMUS OF SUEZ. See SUEZ.

ISTIP, a t. of European Turkey, in Roumelia, on the Istip river; pop. 8,000. It is well built, and has a large trade. It contains some steel-works and the remains of an old castle.

ISTRIA (*ante*), anciently *Histria*, a peninsula of s. Austria, projecting into the n.e. part of the Adriatic sea, and including some islands; between lat. 40° 35' and 45° 50' n. and long. 13° 23' and 14° 40' e.; 1908 sq.m.; pop. 254,905. The peninsula is 50 m. long, with an average breadth of 30 miles. A ridge of rocky mountains runs through its entire length, the highest point of which is Monte Maggiore, 4,200 ft. above the sea. The coast is rugged and rocky and has many excellent harbors. The soil is well adapted to vines, olives, and other fruits. In the mountains herds of cattle find pasture, and marble and freestone are quarried. The fisheries and salt-works furnish employment to many of the people. The Istrians belonged to the stock of Illyrians, and like them were pirates. The Romans subdued them first about the beginning of the 2d c. B.C., and reconquered them in the following century. Their independence was finally overthrown by C. Claudius, 177 B.C., their country, united to Italy, continuing subject to Rome till it fell into the hands of the Goths in the 6th century. The eastern emperors, drove out the Goths and retained the country till the 10th and 11th centuries, when it became subject to Carinthia and Dalmatia. The Venetians in the 13th c. seized the western part, and Austria the eastern, both of which on the overthrow of the Venetian republic, 1797, were by treaty made over to Austria. From the downfall of Napoleon in 1813 till 1849, Istria formed a part of the government of Trieste.

ITACOLUMITE, a peculiar, siliceous, metamorphic schistose rock, found accompanying talcose slates and schists, composed principally of quartz grains with hydrous mica, which latter mineral makes it flexible, whence it is called flexible sandstone. Its flexibility is peculiar, bending as though made of short joints. It is found in Brazil, the Ural mountains, Georgia, North and South Carolina, and elsewhere, particularly in sections of these regions where there is gold. It has been observed by Lieber that in South Carolina itacolumite passes gradually into sandstone and conglomerate, showing its sedimentary origin.

ITALIAN WINES. The wines of Italy are not very highly valued in other countries, and almost the whole quantity produced is consumed at home. Those of the n. are for the most part disagreeably acid, and scarcely any one of them can be preserved beyond one year. The vines are grown not so much in vineyards as in the hedgerows—a system which doubtless injures the quality of the wine. In the southern parts, however, where the vines are grown in low vineyards as in France, the wines are of a more fiery quality, and though prepared with little care, they require only to be better known to be esteemed by foreigners. A great variety of wines is produced in Piedmont, and those of Asti and Chaumont have acquired a reputation. The so-called Malvasia wines of Sardinia are produced at Sorso, Posa, Alghiere, and Naxo. The Malvasias of Caunonas, Monai, and Garnaccia are exported. The best Italian wines, however, are produced in Tuscany, partly because the climate is most favorable, partly because the former government and many nobles paid great attention to the improvement of the vineyards. Of vines, the Aleatico, or red muscat, is most extensively grown, at Monte Pulciano, between Sienna and Rome; at Monte Catini, in the Val de Rievole, and at Ponte a Moriano. The wine is purple in color, sweet, and slightly astringent in taste. A good red wine is made at Chianti, near Sienna, from a peculiar grape. The wines of Artimino, a former grand-

ducal estate, and of Carmignano, are also of good quality. At Arcetri, near Florence, was prepared the best Verdea, or green wine, so called from its color, and much esteemed by Frederick the great of Prussia. Another celebrated wine is the Trebbiano, a gold-colored syrup. From the Venetian plain the cultivation of the vine extends into many of the valleys of the Alps which open into it, particularly that of Udine, the valley of the Tagliamento, up to Tolmezzo, and the Piave. In many of these valleys viticulture might attain the highest perfection if it were directed to quality, and if selected vines were grown in closed vineyards with that care and attention which are bestowed upon this branch of production on the Rhine and in France. The former Papal states of central Italy produce the wines of Orvieto, and the muscats of Albano and Montefiascone. Lachrymæ Christi is produced from vines grown at the base of Mt. Vesuvius, and is reputed to be the strongest of the wines in the Naples district. The province of Puglia or Terra d'Otranto produces the wines of Gallipoli and Taranto. Of Sicilian wines only one variety is exported in large quantities, namely, the white or light amber or brown wine, which goes under the name of the exporting town of Marsala. In the neighborhood of Messina there is grown the Faro wine, reputed to be the strongest wine of n.e. Sicily. Near Mt. Etna is made the wine of Terre Forte, in the vineyards of the Benedictine monks.

ITALY, FREE CHURCH IN, established by the Italian patriot and reformer Gavazzi. It originated with the dawn of civil liberty in 1848, when men began to read the Bible, though for the act they were sent to prison and exile. But in 1853 a free church was begun in Turin. After Pius IX. had changed his liberal policy, Gavazzi was arrested by his orders, but, being rescued by the citizens of Viterbo, he visited England, Scotland, and subsequently the United States, where in addresses to crowded assemblies, he related the wrongs of the Italian nation. The movement for a free church made but little progress for want of union. In 1870 Gavazzi returned to Italy; a general assembly was held, in which 23 churches were represented; a confession of faith was prepared; and the name *Free Church in Italy* was adopted. This confession is a declaration of the principles held by all evangelical Christians, and the Free church is in harmony with the Waldensian and other Protestant churches. The constitution is partly Presbyterian and partly Congregational or Independent, the general assembly being composed of deputies from the churches, and each church independent of all the others in local affairs. The general assembly appoints the committee that superintends the entire work, and the funds collected by the commissioners are remitted directly to that committee. The Free Church in Italy now has 71 places of worship, 1800 communicants, 800 Sunday-school children, 1700 day scholars, with 21 teachers, 15 ordained ministers, 15 evangelists, 49 elders, 67 deacons, and 11 deaconesses. There is scarcely one important town in Italy in which there is not a Free church congregation. A new church has recently been built in Turin. Native evangelists visit every place. There are several theological colleges. In Rome is a theological seminary near the Vatican, in which Gavazzi is professor of sacred rhetoric. The Free church of Scotland has given it a professor of didactic theology, and Christians in Great Britain have bought and presented to it the old church of San Jacopio in Florence. Recently a valuable church on the piazza San Marco in Venice was purchased. The Free church has received from the city of Florence an annual bounty for one of their schools, and the minister of public instruction in Rome sent a complimentary letter with 300 francs. The Free church, since its regular organization, has grown steadily, and its influence is felt in every province of Italy.

ITAMARATI, a beautiful cascade in Brazil, about 50 m. n.w. of Rio Janeiro. It is nearly perpendicular, and the height about 250 feet.

ITARD, JEAN MARIE GASPARD, 1775-1838; b. France. Without a medical education, he was appointed assistant surgeon in the military hospital at Toulon, at the hospital of Val de Grâce, and a physician to the deaf and dumb institution. He was noted for his training of the wild boy of the forests of Aveyron, of which he gave an account in two works, 1807, and for the success of his treatment of deaf mutes. His *Diseases of the Ear*, 2 vols., 1821, is a standard medical work.

ITASCA, LAKE, a lake in Minnesota, lat. 47° 10' n., about 8 m. in circumference, one of the sources of the Mississippi, and 1575 ft. above the sea. It is a beautiful body of water in the midst of pine-covered hills.

ITASCA, a co. of Minnesota, bounded by Rainy lake and Rainy Lake river, s.w. by the Mississippi; 5,200 sq. m.; pop. '70, exclusive of Indians, 96. It is drained partly by Big Fork river, and partly by some tributaries of Rainy Lake river. There are many lakes, marshes, and pine forests. There is here a reservation of Indians.

ITHACA (*ante*), the capital of Tompkins co., N. Y., 142 m. s.w. of Albany, 37 m. s. of Auburn, and 40 m. s.e. of Geneva; pop. '70, 10,058; a beautiful town, built partly on a plain, partly on slopes of high hills, amid picturesque scenery. Three streams here enter the lake, falling from the hills in a series of cascades of remarkable beauty. It is the seat of Cornell university, has several public and private schools, a preparatory school, a large free library, 14 churches, 2 national banks, good hotels, 7 newspapers, and several manufactories for paper, flour, agricultural implements, calendar clocks,

carriages, steam-engines, and machinery. It is the terminus of the Cayuga Southern railroad, and on the Utica, Ithaca and Elmira railroad. A branch of the Delaware, Lackawanna and Western railroad extends from this place to Owego. Daily steamboats on the lake connect Ithaca with the New York Central railroad at Cayuga.

ITHU'RIEL. According to *Paradise Lost*, one of the two guardian angels directed by Gabriel to discover and bring before him Satan, who had surreptitiously obtained access to the garden of Eden for the purpose of beguiling Adam and Eve.

Ithuriel and Zephon, with winged speed
Search through this garden; leave unsearched no nook;
But chiefly where those two fair creatures lodge,
Now laid, perhaps, asleep, secure of harm.

—*Paradise Lost*, Book IV.

ITINERANCY, a term applied to limited pastorates in the Methodist church. The system originated with Wesley. To accomplish what he considered necessary for the revival of religion in England, he traveled from town to town, and, remaining but a day or two in a place, he adopted the plan of commissioning a few competent men to preach in the societies which he had organized. These helpers, as he called them, rapidly increased, but the societies increasing still more rapidly, he found it necessary to extend and methodize their labors on some plan of itinerancy, and accordingly appointed them to definitive "circuits" for a year. At first the whole country was divided into 7 of these itinerant districts, and at Wesley's death there were 72 in England, 3 in Wales, 7 in Scotland, and 28 in Ireland. The "circuits" were long, and the preachers were changed from one circuit to another every year or two. The "circuit" system is still retained in England, and exists in America among the feeble churches, and generally among the frontier settlements of the west. The societies in cities and the large societies in the country are generally "stations," each being supplied by its own pastor. Connected with the itinerancy of Wesley were the local ministry, or gifted laymen in secular business, who preached in the absence of the regular or itinerant preachers, and the weekly class-meeting of 12 members under an experienced leader. Wesley adopted this system from expediency, as it enabled one preacher to serve in many places, and made small abilities available on a large scale; and he found by experience that a frequent change of teachers was best. The itinerant system has always been cherished with great care by the Methodists, though the length of time for which a minister may remain on the same "charge" has varied at different times from one to three years. Many in the Methodist church are dissatisfied with the system of frequent removals, and its comparative advantages and disadvantages have been fully discussed in their leading periodicals.

ITUTUS PORTUS, the place where Cæsar, 55 and 56 B.C., set out for the conquest of Britain. Its site has been much disputed, but the best geographers, as D'Anville and Long, now agree that the actual spot was the village of Wissant or Duessant, on the coast of France.

ITURÆA, a district of ancient Syria, which, with Trachonitis, formed in the time of Christ the tetrarchy of Philip, bequeathed to him by his father, Herod. The name is supposed to have originated from Itur or Jetur, one of Ishmael's sons, and the country to have formed part of the kingdom of Bashan. Pliny places it n. of Bashan, near Damascus, and J. de Vitry as adjoining Trachonitis. Ituræa was first annexed to Syria by Claudius. It is probably the same as Jedur, which contains 38 towns and villages, some of which are desolate, and the rest occupied by poor peasants.

ITURUP, the largest of the Kurile Islands, belonging to Japan, n. lat. 44° 29', e. long. 146° 34'. It is 140 m. long, with an average width of 20 miles. It is of volcanic origin, fertile, and well-watered. The people are employed chiefly in hunting and fishing.

ITZA, LAKE OF. See **PETER**.

ITZAS', or **ITZAES**, an interesting tribe of Central American Indians, inhabiting the shores of lake Itza, in Guatemala. Their history points to an extensive early civilization. According to their traditions, one of the caneks or princes of Yucatan migrated south, 1420, and built a city on the island of Tayasal in lake Itza, which with the island soon contained a population of 25,000. They were visited by Cortés, 1525, who gives an account of their high advancement and friendliness of character. From their isolated position they were able to maintain their independence until 1698, when they were overcome by Manuel de Ursula, the Spanish governor of Yucatan, their cities laid waste and their temples destroyed. A small remainder of them are found on the islands of lake Itza, who are nominally Roman Catholic.

IVES, **ELI**, 1779-1861; b. Conn.; graduated at Yale college in 1799, studied medicine with Dr. Levi Ives, his father, and was associated with prof. Benjamin Silliman in founding the medical school of Yale, where he was prof. of materia medica and of the theory and practice of medicine. He was once president of the national medical association.

IVES, **LEVI SILLIMAN**, D.D., LL.D., 1797-1867; b. Conn. He worked on his father's farm in his youth, served a year in the army of 1812, and studied at Hamilton college;

with the view of entering the ministry of the Presbyterian church. In 1822 he took orders in the Protestant Episcopal church. He had charge of churches in Philadelphia, Lancaster, Penn., and New York. In 1831 he was consecrated bishop of North Carolina. During the Tractarian controversy in the Episcopal church his Roman Catholic proclivities were so marked, that his diocese distrusted him and became alienated. In 1852 he visited Rome, and was admitted into the Roman church. On his return he was deposed from his bishopric. The rest of his life was spent in the work of education and in the prosecution of several philanthropic enterprises. He was prof. of rhetoric in the Roman Catholic theological seminary at Fordham, N. Y. He published *The Trials of a Mind in its Progress Towards Catholicism*. He had notable gifts as a preacher and writer.

IVORY, ARTIFICIAL. See CELLULOID.

IVORY, JAMES, 1765-1842; b. Scotland; an eminent mathematician, educated at the university of St. Andrews, and professor of mathematics in 1804 in the royal military college of Marlow. In 1819 he retired with a pension. He was a member of many of the learned societies of England and Germany. His essays read before the royal society of Edinburgh, and his papers in the *Transactions* of the royal societies of Edinburgh and London, evince a mind of remarkably acute analytical power. He was granted, in 1831, an annual pension of £300.

IVORY COAST, that part of the coast of upper Guinea which lies e. of the Grain coast and w. of the Gold coast. It extends from cape Palmas to the Assinie river. It contains several small towns, which have a traffic in gold-dust, ivory, and palm oil. The coast is low and unhealthy, but in the interior are extensive and fertile table-lands.

IVRY-LA-BATAILLE, a village of France, on the river Eure, 40 m. w. of Paris, pop. 1053. It was strongly fortified and held by the English, but was captured from them in 1449, and the fortifications were destroyed. It is better known as the scene of the great victory of Henry IV. of Navarre, Mar. 14, 1590, over the duke of Mayenne. The obelisk erected to commemorate the battle was removed in the French revolution, but restored by Napoleon in 1809.

IWA'KURA TOMO'MI. A Japanese statesman, b. in Kioto about 1825, of one of the illustrious families called kugé (court nobles). Made personal attendant upon the mikado at the age of 20, he openly opposed the parsimonious support given to the emperor by the Tokugawa usurpers at Yedo, whom he was further led to oppose from their assumption, in the official documents of the American treaty, of the preposterous title of "Tycoon" (exalted prince), their true title being shōgun (general). In 1858 Iwakura opposed the opening of the ports to foreign trade, a measure then being urged at Yedo by the American minister, Townsend Harris, but approved of the marriage of the princess Katsuno-Miya to the shōgun at Yedo. Having the overthrow of the Tycoon ever in view, Iwakura became the willing agent, in the palace, of Saigo, Kido, Okubo, and the other revolutionary leaders, and largely through him the Yedo usurpation was overthrown, the mikado restored to supreme power, the feudal system destroyed, and all Japan unified under the present government at Tokio. In 1872 Iwakura was made minister of foreign affairs, and junior prime minister of the right, and with Kido, Okubo, and Ito, sent on an embassy to the treaty powers of the world, coming to Washington first. He opposed the invasion of Corea, and was severely wounded by assassins in 1874. Since 1867 he has been the foremost man in the Japanese cabinet, and nearest to the mikado. He is a man of great eloquence, energy, decision, and culture—"the Bismarck of Japan." Three of his sons were educated in the United States.

IXCAQUINTLA, a t. in Puebla, Mexico; pop. 5,000; noted for a severe battle, Jan. 1, 1817, between the Spanish troops under La Madrid and the Mexican rebels under gen. Mier. It is occupied by the Chuchon Indians, the remnants of a race of southern Mexico who were conquered by the Aztecs and Mixtecas. Near the town are numerous mounds of earth or stone, now used by the Indians as altars for their offerings to Montezuma.

IXION, in Greek mythology, a king of the Lapithæ. When Deïoneus, whose daughter Dia he had espoused, demanded the usual nuptial gifts, Ixion invited him to a feast on pretense of paying him, and caused him to fall into a pit of fire which he had secretly prepared. Shunned by all for his treachery, Jupiter in pity invited him to his table, but, discovering his attempt to seduce Juno, he condemned him to be fastened to a perpetually revolving fiery wheel. He was the supposed father of the centaurs.

IXMIQUIL'PAN, a t. and district in the state of Hidalgo, Mexico, on the river Montezuma, 80 m. n. of the city of Mexico; pop. 10,000. In 1861 it was for some months the head-quarters of gen. Zuloaga, who claimed to be president. The inhabitants are mostly Indians of the Otomi race. In the vicinity of the town there are several silver mines owned by English companies.

IXTAPALAPA, a t. of Mexico, 10 m. s.e. of the capital; pop. 5,000. When Mexico was conquered it was a large and important city, noted for the beautiful gardens of the Aztec kings, and was the residence of a brother of Montezuma.

ITSLAHUA'CA, a district in Mexico, in the northern part of the state of the same name, 60 m. from the city of Mexico. It was anciently the abode of the large and important race of Mazahua Indians. It has silver mines, which for lack of capital are not now worked.

ITSLAN', a t. and district of Mexico, in the state of Oaxaca, 40 m. from the city of Oajaca, occupied mostly by the Zapoteco Indians. It has numerous silver mines. In the neighborhood of Itslan is the village of San Pablo Guclatao, the birthplace of president Benito Juarez.

ITLILXO'CHITL, FERNANDO DE ALVA; b. Mexico about the middle of the 16th c., and lived to a great age. He was a descendant of the kings of Tezucuo, was interpreter of the native languages to several viceroys of Mexico, and a laborious collector of the ancient MSS. and traditions of his country. Both Mr. Prescott and lord Kingsborough made use of his writings in the compilations of their histories. Many valuable manuscripts of his are in the archives of Mexico.

IYE' YASU. See TOKUGAWA.

IZABAL, a seaport of Guatemala, 123 m. from the capital, on the s. shore of lake Dolce or Izabal. It is 40 m. from the sea by the river Izabal or Rio Dolce. The water being low at the mouth of the river large vessels go to Balize, and their cargo is sent by coasting vessels to Izabal.

IZALCO, a t. in the republic of San Salvador, Central America, 40 m. s.w. of the city of San Salvador; pop. 4,000, mostly Indians. It was anciently a place of importance, especially for the cultivation of the cacao, but the earthquake of 1859 greatly affected its prosperity. The soil is well watered and fertile.

This is also the name of a remarkable volcanic mountain 36 m. n.w. of the city of San Salvador. It is near a group of extinct volcanoes about 6,000 ft. in height; and the first eruption occurred in 1770 during an earthquake. The eruptions are almost incessant, though of unequal violence, and are visible far out at sea. Mariners call it the "light-house of San Salvador."

IZAMAL', a city of Yucatan, 50 m. s.e. of Merida. A church and convent were built here in the 16th c. by the bishop of Yucatan. The ruins of an ancient city are found, which Mr. Stephens describes in *Travels in Yucatan*.

IZARD, a n. co. of Arkansas, drained by the White river, and bounded by it on the n.w.; 550 sq. m.; pop. '80, 10,856. It is partly mountainous, and the soil is fertile. The staple products are wheat, maize, oats, cotton, and tobacco. Some minerals are found. The capital is Melbourne.

IZARD, GEORGE, 1777-1828; b. S. C. After receiving a classical education he traveled extensively in Europe. In 1794 he was appointed lieut. of artillery; in 1798 he had charge of the fortifications of Charleston harbor; and in 1799 was aid to gen. Hamilton. When the second war with Great Britain began he was appointed col. of artillery, Mar. 12, 1812; in 1813 was brig. gen.; in 1814 maj. gen. He was governor of Arkansas territory from 1825 till his death.

IZARD, RALPH, 1742-1804; b. S. C.; educated at Cambridge, England. He was a southern planter of great wealth in land and slaves inherited from his grandfather, who was one of the founders of South Carolina. He distinguished himself in the revolutionary war. During a residence in London, in 1771, he endeavored to show the British ministry the impolicy of their conduct towards the colonies, but, failing in his good intentions, he retired in 1774 to the continent. In 1780 he returned to the United States, and by his influence obtained the appointment of gen. Greene to the command of the southern army. He evinced his patriotism by pledging his fortune to procure ships of war from Europe. He was a delegate to the old congress, 1781-83, and United States senator, 1789-95. He died at South Bay. He was polished in manners, an eloquent speaker, but of a passionate temper. His correspondence was published by his daughter in 1844.

IZDUBAR', a name found in Chaldean inscriptions recording ancient Babylonian legends, by some investigators supposed to be that of a veritable Babylonian king, but by others, including Max Müller and Rawlinson, supposed to signify the Hercules of the Chaldean mythology. The fact of the name occurring in inscriptions, possessed by the British museum, in connection with 12 legends not unlike those which describe the 12 labors of Hercules, has led to this latter conception. Meanwhile, other evidence derived from a similar source would appear to signify that this character was a king, in Babylonia, who is, by some writers, identified with the biblical Nimrod, and who was deified after his death on account of his marvelous accomplishments. Mr. George Smith, of the British Museum, held this view of the matter, and in his *Assyrian Discoveries*, published in London in 1875, made a translation of the legends and inscriptions in question.

IZTACCHUATL, an extinct volcano in Mexico, 15,705 ft. above the sea, near Popocatepetl, and 30 m. from Puebla. It is often called Sierra Nevada from its being covered with snow. The name, composed of the Mexican words *iztac*, white, and *cihuatl*, woman, was given on account of its resemblance to a woman in a white dress.

IZU'CAR, or MATAMO'ROS IZUCAR, a city and district of Puebla, Mexico. The city is 90 m. s.e. of Mexico, at the base of Popocatepetl; pop. 12,000. It is the center of a rich sugar region. A railroad was commenced in 1875 to connect it with Puebla. It takes its name from the Mexican gen., Manuel Matamoros.

J

JABBOK, a stream which intersects the mountain range of Gilead, and after a course nearly from e. to w., falls into the Jordan midway between the sea of Galilee and the Dead sea, 30 m. below the lake of Tiberias. Its whole length is about 65 miles. It was the boundary between the territories of the Amorites and Ammonites, and afterwards between the tribe of Reuben and the half-tribe of Manasseh. Its modern name is Wady Zerka. In its passage westward it runs more than once underground, but as it enters the more hilly country e. of the Jordan, its volume is increased from several springs which render it perennial. On approaching the Jordan it flows through a ravine deep, narrow, and wild, the steep banks of which, in nearly its whole course, are covered with cane and oleander. The scenery along the Jabbok is said to be the most picturesque in Palestine.

JABLONSKI, PAUL ERNST, 1695-1757; b. Berlin; the most distinguished oriental scholar of his time. After completing the usual course at Frankfort-on-the-Oder, he applied himself to eastern languages, especially the Coptic, and at the age of 21 was sent by the Prussian government to pursue his studies in the libraries of Oxford, Paris, and Leyden. On his return he became pastor of the Protestant church at Liebenberg, and professor of theology at Frankfort. He was a member of the academy of sciences of Berlin. His works numbered 50, the most valuable of which is the *Pantheon Ægyptiorum*, 3 vols., 1750-52.

JABORANDI, a name given in South America to several species of plants used as diaphoretics. The plant grows chiefly in Brazil, and is most known in the neighborhood of Pernambuco. The botanical name is *pilocarpus pennatifolius* (Lemaire). The leaves are imparipinnate, composed of 4 to 10 short-stalked leaflets about 4 in. long, ovate-oblong, upper surface dark-green, shining, under surface paler, smooth or slightly hairy, midrib prominent. When bruised they are aromatic; taste somewhat bitter. The important constituents are a volatile oil, and an alkaloid called *pilocarpin*, which combines with various acids to form salts. According to Kingzett (1876) the chemical formula for the alkaloid is $C_{23}H_{31}N_4O_4$. According to Hardy the oil consists of a hydrocarbon, *pilocarpene*, having the formula $C_{10}H_{16}$; sp. gr. 85° ; boiling-point, 352.4° F.; another hydrocarbon boiling at 492° F., and a third having a still higher boiling point, being a transparent solid when isolated, at ordinary temperatures. An infusion of the leaves or a fluid-extract or tincture, may be given internally; or one of the salts may be administered with a hypodermic syringe. When an infusion of 90 grains of the dried leaves, or an extract or tincture of corresponding strength is swallowed, it produces, in the course of two or three minutes, a flushing of the face, and in the course of five or six minutes drops of sweat appear on the forehead, and soon afterwards on other parts of the body and limbs. When sweating is established the face becomes pale, and a profuse secretion of saliva and nasal and bronchial mucus is poured out upon the mucous surfaces, and often there is an abundant secretion of tears. The salivation is often so profuse as to interfere with speech. The average duration of sweating is about one hour and a half, and the temperature usually falls 1° F. The average loss of fluid by sweating is nearly two pints, but the loss is said sometimes to be four quarts if the salivary and mucous secretions are included. Sometimes, though rarely, sweating does not take place, but salivation is more frequently absent than sweating. Vomiting is a usual occurrence, but the nausea is not great. The quantity of urine secreted during the sweating is diminished, and is passed with pain. Urea appears in the perspiration and saliva. The sight frequently becomes dimmed—an effect attributed to the action of the drug on the muscles of accommodation belonging to the lens. See EYE. Jaborandi is an effective galactagogue, or promoter of the lacteal secretion. When given in moderate doses it increases the flow of milk, and on this account is one of the most valuable late additions to the materia medica. The hypodermic injection of one-sixth or one-fifth of a grain of *pilocarpin*, or the muriate, produces much the same effects as the internal administration of the infusion of the leaves, but the action is more prompt as well as more lasting. With the hypodermic injection sweating always takes place, and vomiting is less frequent.

The medical uses of jaborandi are numerous. It often promptly relieves the distressing symptoms of pleurisy by removing the fluid in the pleural sac. See PLEURISY. In hydrothorax the relief given is even more noticeable, and also in many cases of dropsy, those arising from certain forms of kidney disease being often cured. In dropsy caused by heart-disease the relief which it affords is more temporary; and it should be used with great caution by those disposed to cardiac affections, as it possesses peculiar power in restraining the contractions of the heart, and is used by experimental

physiologists in investigating the functions of the nervous system. In those dropsical affections, however, which are connected with simple hypertrophy of the ventricles, the use of jaborandi is attended with marked benefit. Dr. Gaspar Griswold, of New York, has employed the muriate of pilocarpin as a hypodermic injection in several cases of intermittent fever with almost uniform success. See INTERMITTENT FEVER. According to Galezowski, pilocarpin is equal to eserine, the active principle of the Calabar bean (q.v.), in producing contraction of the pupil, and is employed in ophthalmic surgery in cases where atropine, which produces dilatation of the pupil, is contraindicated. It is reported to have been used in *mumps* with signal benefit, and in *asthma* it has been found to give great relief. The salts of the alkaloid may be given internally in doses of from one-fourth to three-fourths of a grain, and hypodermically from one-sixth to one-fifth of a grain, dissolved in water.

JACARÉ, the *crocodilus sclerops* of Schneider, or more recently the *jacaré sclerops*, a South American reptile allied to the alligator and cayman, and whose place has not, perhaps, been definitely assigned. The alligators and caymans belong to the family *crocodilidae*, and it has been proposed (see ALLIGATOR) to constitute a sub-family, *alligatoridae*, dividing it into genera, *jacaré*, *alligator*, and *cayman*, and that classification is here adopted. The animal is found principally in the tropics, never, according to Azara, below 32° s. lat. It is particularly numerous in Brazil, where it attains a larger size than the North American crocodile or alligator. The head is rather thinner than that of the latter animal, the sides converging towards the snout, forming an isosceles triangle. The surface of the cranial bones has a rough, scabrous appearance, as if diseased. The orbits are surrounded by prominent ridges of bone, connected together by a median ridge, the whole presenting the appearance of a pair of spectacles. Behind the orbit the skull is pierced by two very small holes. The cervical plates are very large, are arranged in four transverse bands, the first two containing four plates each, and each of the others two. The transverse bands of the back, varying according to age and, probably, with the individual, usually consist of two rows with two plates each, four rows with six plates each, five rows with eight plates each, two with six, and four with four plates each. The jacaré is greenish brown on the upper side and on the under side marbled with various shades of green and greenish yellow. It attains a size of from 14 to 18 ft., the head forming about one-ninth of the whole length. It is not as fierce as the Mississippi alligator, and is said never to have been known to attack men unless near where it has laid its eggs. Their preferred food is fish and waterfowl, of which there is generally an abundance in the waters which they inhabit. Their eggs are about the size of those of a goose, white, and much sought after by the natives as food, who also eat the flesh of the reptile, but it has a strong, musky smell, and but little juiciness. The female deposits her eggs in the sand in a single layer, covering them with straw or leaves, but the vultures find most of them, and many of the young are devoured by the adult males when the rivers become low and other prey is scarce. See ALLIGATOR, CAYMAN, and CROCODILE, *ante*.

JACHMANN, EDUARD KARL EMANUEL; b. Dantzic, 1822; a distinguished naval officer, rising from the position of a common sailor to be a director (1857-9) of the Prussian admiralty. In 1862 he commanded an expedition to China; in 1864 defeated the Danes at the island of Rügen; in 1867 was placed at the head of the naval department; in 1868 was made vice-admiral; and in the Franco-German war (1871), had command of the Baltic fleet, and was commander-in-chief of the whole German navy.

JACK, a co. in n. Texas, intersected by a fork of Trinity river; 900 sq.m.; pop. '70, 694. It is partly covered with forests. The soil is not much cultivated. Stock-raising is the chief employment. Co. seat, Jacksborough.

JACK SCREW, a machine for raising heavy weights, chiefly buildings of various kinds, as houses and ships. It has various forms, the most powerful being a differential screw. The most convenient form, however, is a single screw and nut, the inclined plane of the screw being as near a horizontal as is consistent with the thickness of the thread and diameter of the screw. Other devices of the kind are employed, as the hydraulic jack (q.v.).

JACKSON, a co. in n.e. Alabama, bordering on Tennessee and intersected by the Tennessee river; 1100 sq.m.; pop. '80, 25,114. It is hilly, extensively covered with forests, and fertile. The staples are cotton, wheat, maize, grass, and pork. The Memphis and Charleston, and the Nashville and Chattanooga railroads, traverse it. There are several flour and saw mills and tanneries. Co. seat, Stevenson.

JACKSON, a co. in n.e. Arkansas; bounded n.w. by Black river, and traversed by White river and the Cairo and Fulton railroad; 600 sq.m.; pop. '80, 10,877. It is level, well wooded, and fertile. The staple products are cotton, maize, hay, and fruits. Co. seat, Jacksonport.

JACKSON, a co. in n. Florida, bordering on Alabama; bounded e. by the Chattahoochee and Appalachicola rivers, and drained by the Chipola; pop. '80, 14,372. The surface is level, and partly covered with pine forests. The soil is fertile, producing cotton, rice, sugar-cane, maize, and tobacco. Co. seat, Marianna.

JACKSON, a co. in n.e. Georgia; 450 sq.m.; pop. '80, 16,298. It is drained by two branches of the Oconee river, and intersected by the North-eastern railroad. It is hilly and well wooded. The staple products are cotton, maize, wheat, tobacco, and pork. Iron and granite abound. Co. seat, Jefferson.

JACKSON, a co. in s. Illinois; bounded s.w. by the Mississippi river, and drained by the Big Muddy; 580 sq.m.; pop. '70, 19,634. It is traversed by the Illinois Central, the Grand Tower and Carbondale, and the Cairo and St. Louis railroads. It is hilly and mostly covered with forest trees. The soil is fertile, producing wheat, maize, oats tobacco, fruits, and pork. It has abundant coal-beds, salt-springs, and quarries of limestone, and several manufactories and mills. Co. seat, Murphysborough.

JACKSON, a co. in s. Indiana, 560 sq.m.; pop. '70, 18,974. It is drained by the e. fork of White river; bounded s. by the Muscatatuck, and traversed by the Ohio and Mississippi, and the Jeffersonville, Madison, and Indianapolis railroads. The surface is undulating, and much of it covered with forests. The soil is fertile. The staples are wheat, oats, maize, fruits, and pork. There are numerous carriage and woolen factories and flour and saw mills. Co. seat, Brownstown.

JACKSON, a co. in e. Iowa; bounded n.e. and e. by the Mississippi, and intersected by the Maquoketa; 628 sq.m.; pop. '80, 23,771. The surface is broken, well wooded, and the soil very fertile. The staples are wheat, oats, maize, hay, butter, and cattle. Mines of iron and lead are found. The co. is traversed by the Sabula, Ackley, and Dakota, and Iowa Midland railroads. The chief articles of manufacture are carriages, furniture, and saddlery. There are numerous flour and saw mills. Co. seat, Maquoketa.

JACKSON, a co. in n.e. Kansas; 658 sq.m.; pop. '78, 7,930. It is drained by Bills and Straight creeks. The Kansas Central, and the central Branch of the Union Pacific railroads intersect it. The surface is varied with prairie and woodland. The soil is fertile. The staples are maize, oats, wheat, hay, and live stock. This co. is part of the coal-field of Kansas. Co. seat, Holton.

JACKSON, a co. in s.e. central Kentucky; 300 sq.m.; pop. '80, 6,678. It is drained by the forks of Rock Castle river. The surface is hilly, and about half-covered with forests. The soil is fertile, producing maize and grass. Co. seat, McKee.

JACKSON, a parish in n. Louisiana; 730 sq.m.; pop. '80, 5,328. It is drained by Dugdemona river and some bayous. The surface is uneven, and covered extensively with forests. The soil is generally fertile. The staples are cotton, maize, sweet potatoes, and pork. Co. seat, Vernon.

JACKSON, a co. in s. Michigan; drained by the Grand, Kalamazoo, and Raisin rivers; 720 sq.m.; pop. '80, 42,031. It is traversed by the Michigan Central and Grand River railroads, and by others connecting with these at Jackson. The surface is nearly level, and extensively covered with forests. The soil is a sandy but fertile loam. The staples are wheat, maize, oats, wool, and butter. The co. has iron, bituminous coal, limestone, and sandstone. There are numerous factories for carriages, agricultural implements, boots and shoes, and saddlery; also flour and saw mills. Co. seat, Jackson.

JACKSON, a co. in s. Minnesota, bordering on Iowa; 720 sq.m.; pop. '80, 4,806. It is intersected by the Des Moines and Chanyuska rivers. The surface is diversified with prairies and numerous lakes, the largest of which is Heron lake. The soil is fertile, producing wheat, oats, potatoes, and grass. The co. is traversed by the Sioux City and St. Paul railroad. Co. seat, Jackson.

JACKSON, a co. in s.e. Mississippi; bounded e. by Alabama, and intersected by the Pascagoula and Escatawpa rivers; 950 sq.m.; pop. '70, 4,362. It is level, sandy, and mostly covered with pines. The productions are chiefly rice, maize, and potatoes. It is crossed by the New Orleans, Mobile, and Texas railroad. Lumber is largely exported to New Orleans. Co. seat, Scranton.

JACKSON, a co. in w. Missouri; bounded w. by Kansas, n. by the Missouri river, and drained by Big Blue and Little Blue rivers; 650 sq.m.; pop. '80, 82,364. It has a fertile limestone soil, and an uneven surface partly covered with forests. The Missouri Pacific railroad crosses it, and other important railroads have their terminus at Kansas City. The staple products are wheat, oats, maize, grass, and live stock. Limestone is abundant. There are many manufactories for carriages, furniture, saddlery, clothing, cigars, etc., and some flour and saw mills. This co. ranks second in the state for population and wealth. Co. seat, Independence.

JACKSON, a co. in s.w. North Carolina, bordering on South Carolina; 600 sq.m.; pop. '80, 7,343. It is drained by the Tuckasegee river. It is mountainous, and to a great extent covered with forests. The soil is fertile. The staples are maize, wool, grass, and pork. Iron, gold, and marble are found. Co. seat, Webster.

JACKSON, a co. in s. Ohio; drained by the Little Scioto river and Symmes creek; 400 sq.m.; pop. '70, 21,759. It is hilly and well timbered. The soil is generally fertile, producing wheat, oats, maize, and hay. Iron and bituminous coal are abundant, and beds of limestone are numerous. There are several manufactories, flour and saw mills. It is traversed by the Marietta and Cincinnati railroad. Co. seat, Jackson.

JACKSON, a co. in s.w. Oregon; bounded s. by California; 3,000 sq.m.; pop. '80, 8,154. It is traversed by the Cascade and other mountain ranges. The western part is drained by Rogue river, and is fertile; but much of the eastern is uncultivated. The surface is uneven, and much of it covered with forests. The climate is very various. Gold and iron have been found. The staples are wheat, barley, oats, maize, and livestock. Co. seat, Jacksonville.

JACKSON, a co. of middle Tennessee; 300 sq.m.; pop. '70, 12,583. The northern part originally included Clay co., which now separates it from Kentucky. The surface is irregular and covered extensively with forests. The soil is fertile, producing wheat, maize, tobacco, and grass. Co. seat, Gainesborough.

JACKSON, a co. in s. Texas; 800 sq.m.; pop. '80, 2,723. It is drained by the Lavaca and Navidad rivers. The s.w. part borders on Lavaca bay. The surface is prairie and woodland. The soil is generally fertile. The staples are cotton, maize, grass, and cattle. Co. seat, Texana.

JACKSON, a co. in w. West Virginia, bounded n.w. by the Ohio river; 440 sq.m.; pop. '80, 16,312. It is hilly, and a large part is covered with forests. The soil is generally fertile, producing maize, wheat, oats, and tobacco. Limestone is found. Co. seat, Jackson Court-house, sometimes called Ripley.

JACKSON, a co. in w. Wisconsin; 1000 sq.m.; pop. '75, 11,339. It is intersected by Black river, and in part drained by Fox river and some creeks. The surface is irregular and well wooded. The soil is generally good. The staples are wheat, oats, maize, grass, and lumber. The West Wisconsin railroad crosses the county.

JACKSON (*ante*), the co. seat of Jackson co., Michigan, on the Michigan Central railroad, 94 m. s.e. of Grand Rapids. It is a city of great commercial activity, and is in a prosperous farming region. Pop. '80, 16,121. It was incorporated 1857, and has 5 banks, 16 churches, 2 large union and several graded public schools, gas-works, and Holly water-works. Among the public buildings are the state prison, built of stone, 500 ft. long, inclosing 8 acres; the finest passenger station in the state, built by the Michigan railroad company, and the principal railroad machine shops. There is a business college, and a young men's library of 2,500 vols.

JACKSON (*ante*), the capital of Mississippi, at the junction of the New Orleans, Jackson, and Great Northern, and the Vicksburg and Meridian railroads; pop. about 7,000. It has a large trade in cotton. It has 8 churches, 3 banks, a high school and private schools, a state library of 15,000 vols., 2 hotels, a city hall, street cars, a fire department; 2 iron foundries, sash, door and blind factories. The chief public buildings are the state-house, penitentiary and institutions for deaf-mutes, the blind, and insane. In the war of the rebellion the city was occupied by the federal troops, and much of it destroyed, but it has been rebuilt, and is now prosperous.

JACKSON, a city of Tenn., co. seat of Madison co.; pop. '74, about 8,000. It is on the s. fork of Forked Deer river, and at the junction of the Mobile and Ohio with the New Orleans, St. Louis and Chicago railroads. It is 90 m. n.e. of Memphis, and 107 s.e. of Cairo, Ill. It has 13 churches, a court-house, a national bank, 5 hotels, an opera-house, 5 newspapers, gas-works, planing and flour mills, soda-water manufactories, and the machine shops of the railroad companies. Here are West Tennessee college, the South-western university, founded 1874, several seminaries for girls, and some public schools. Jackson is in a fertile region, and has a growing trade. The chief article of export is cotton.

JACKSON, ABRAHAM REEVES, b. Philadelphia, 1827; received degree of doctor of medicine from the Pennsylvania medical college in 1848; practiced in Stroudsburg, Penn., and Chicago, Ill. In 1872 he was elected professor in the Rush medical college. He is an honorary member of several medical societies, and author of numerous medical works.

JACKSON, ANDREW, LL.D. (*ante*); 1767-1845; b. N. C.; seventh president of the United States. In boyhood he was far more fond of sports than of books, but these sports were soon exchanged for serious work. Though but eight years old when the battle of Lexington occurred, before the war was over he took an active part on the patriot side. In 1781 he and his brother Robert were taken prisoners. The English commander directed Andrew to brush his boots, but the spirited boy indignantly refused, whereupon the Englishman struck him with his sword, inflicting a wound upon his arm and another upon his head; at the same time Robert was knocked down. Andrew was put in prison at Camden, S. C., where he saw the defeat of gen. Greene at Hobkirk hill. The mother procured the exchange of the boy soldiers and took them to her home in Waxhaw, where Robert died from small-pox, and for many months Andrew was very ill. The patriotic mother left her home to nurse Americans in prison at Charleston, and there died of fever. Andrew was alone in the world, and without means; but he went to work for a saddle-maker, adding the incongruous employment of teaching school. His next step was to study law at Salisbury, N. C., but the books of Blackstone were not so attractive to his mind as a good horse-race or other exhilarating sport. While yet under twenty he was admitted to the bar as attorney and counselor, and in 1788 was

appointed public prosecutor in the region now forming the state of Tennessee. It was a new and wild country, and in the prosecution of his duties Jackson had to travel long distances, often at the risk of death from the Indians. Of such traveling, chiefly on horseback, he had about 1000 m. every year. In 1791 he married Rachel Robards, a daughter of John Donelson, one of the pioneer settlers of Tennessee. The marriage was the cause of considerable severe comment from the fact that the woman was divorced under peculiar circumstances. She had been the wife of Lewis Robards, a Kentuckian. She was boarding with Mrs. Donelson, who was then a widow, when Jackson took rooms in the same house. Robards soon afterwards applied to the legislature for an act looking to a divorce, charging his wife with undue familiarity with the young lawyer. The bill was passed, and Jackson supposed it to be a full divorce; so the pair married two years before the divorce provided for by the legislative act (which was to be decreed by a jury) took effect. They married over again; but the union was not happy, and its effects were felt by Jackson even while he was in the executive chair.

When Tennessee was organized as a territory Jackson was made district attorney. In 1796 he was a member of the convention to frame a state constitution, and was on the committee to draft that document. In the same year he was chosen to congress, taking his seat in December. His political sympathies were with Jefferson, and he was one of the twelve who opposed the offering of an address to Washington in answer to his last message to congress, on the ground that he could not approve of all the doings of the administration. Jackson's first work in the house of representatives was a speech in favor of remuneration for services against the Indians. He voted for a tax on slaves, and against furnishing the president's house unless very plainly. Except that he favored the building of three vessels of war, and opposed the purchase of peace from the Algerine pirates, he did nothing more in that congress. But his course pleased his constituents, and he was sent to the U. S. senate in 1797. In that body he was perfectly dumb, neither making a speech nor casting a vote. In April, 1798, he resigned, and was chosen a judge of the supreme court of Tennessee, in which capacity he had to travel over the state on a salary of \$600 a year. At this time he came near having his first passage-at-arms with gov. Sevier, whom he suspected of being concerned in land frauds. A duel was expected, but friends interfered and prevented it. In 1798 a failure in Philadelphia embarrassed Jackson financially; but he resigned his judicial office, sold a large amount of property, and cleared himself from debt. In 1804 he removed to a log-house, afterwards known as "the Hermitage," and engaged largely in the raising of corn, cotton, wheat, horses, and cattle. He was the head of a trading firm, and was doing a large business, when the firm failed in consequence of acts done without Jackson's knowledge. The first of his duels was with Charles Dickinson, who had used objectionable language respecting Mrs. Jackson. They fought at eight paces; Jackson had a rib broken, and Dickinson was killed.

In 1805 Aaron Burr appeared in the southwest and easily enlisted Jackson in his plans for war with Spain, the seizure of Mexico, etc. A ball was given in Burr's honor, and Jackson, in full military costume, introduced the guest to his hosts. In Nov. Jackson supplied Burr with boats and provisions; but a few days later, having cause to suspect the adventurer, he ordered that no further dealings should be had with him, at the same time writing to Burr and demanding the truth. He also wrote to gov. Claiborne of Orleans territory (now Louisiana) and to president Jefferson. Yet he was Burr's friend, and during the trial of the latter at Richmond, although summoned as a witness, he was zealous in his defense. Jackson favored the nomination of Monroe for president; but for some years he avoided politics, living quietly at the Hermitage and attending solely to the raising of crops and cattle.

The declaration of war against Great Britain in 1812 brought to the hero of that war his opportunity. As soon as he heard the news he offered his own services and the co-operation of 2,500 militia under his control. The proposition was gladly accepted, and in Oct. the governor of Tennessee was requested to forward 1500 men to New Orleans. Jackson assembled the men at Nashville, and 2,000 infantry and cavalry were equipped. Early in Dec. the infantry were sent down the river in boats, while the cavalry made their way overland. The forces reassembled at Natchez, where they remained under orders from Feb. 15. Near the last of Mar. orders came from Washington to dismiss the men, but Jackson conducted them back to Tennessee before obeying the order. It is said that in consequence of his courage and endurance at this time his men gave him the *soubriquet* of "Hickory," which was the origin of the "Old Hickory" of later years. The men were dismissed in May, after another tender of service to which Jackson received no answer. He had assumed responsibility for the transportation of his men, but the government permitted his paper to go to protest, and he was on the verge of financial wreck, when a friend, Thomas Hart Benton, afterwards the great Missouri senator, came to his rescue, and, by appealing "from the justice to the fears" of the party in power, finally secured justice. The next incident in the stirring life of Jackson was the Benton fracas. A friend of Jackson named Carroll had a quarrel with and sent a challenge to Jesse Benton, a brother of Thomas H.; Jackson became Carroll's second, and for a time put off the contest. The challenged party sent to his brother in Washington an account of the affair, which was intended to, or at least did, create prejudice against Jackson in the mind of his especial friend. A fiery

correspondence followed between Thomas H. Benton and Jackson, and in the course of oral comment Benton used some of the strongest language of which he was master, all of which was made known to Jackson, who was wrought up to the highest pitch of passion. He declared that he would horsewhip Benton on sight. Early in Sept. Jackson and col. Coffee met the two Bentons in the street at Nashville. Jackson called to Benton to defend himself, and made a movement towards him, while Benton tried to get hold of a pistol. Jackson got his pistol soonest and took aim, his antagonist retreating and he following to the rear door of a hotel, where Jesse Benton fired and put two or more balls into Jackson's left shoulder. Jackson fell; Coffee fired, but missed Benton; then turned upon Thomas H. Benton, when the latter fell down a flight of steps. A nephew of Mrs. Jackson, named Hayes, then mingled in the fray, making a desperate attack upon Jesse with sword-cane and dagger, finally throwing him down and wounding him in a number of places. The interference of an outsider saved Jesse's life, and the fight ended. The physicians decided that Jackson's arm should be taken off, but he would not listen to them, and his resolution saved that member of his body to hold the bridle in many a more honorable encounter.

Ever since the earliest attempts to remove the Georgia Indians from their territory there had been intermittent wars. Emboldened by the war with England, the Creeks in 1813 made further trouble and committed many outrages, the chief of which was the massacre at Fort Mims, Aug. 30. Intense excitement followed, and the whole south-west was aroused. The Tennessee legislature called for volunteers, and resolved to exterminate the troublesome tribe. Jackson was in bed, nursing his shattered shoulder, but he dictated addresses and was in spirit in the field. Although his wound still caused intense pain, he joined his division Oct. 7, and on the 11th they marched, and for 32 m. at the rate of five and one-third miles an hour, to overtake the Indians, which, however, they failed to do. Nov. 3 col. Coffee defeated the Indians, and on the 9th Jackson gave them a crushing blow at Talladega. But the commissariat was badly managed, and Jackson's men were almost in mutiny, from which cause these victories were of much less consequence than they would have been under favorable conditions. In Jan., 1814, Jackson, with less than 1000 men, invaded the Indian territory, winning two important victories before the close of the month. In both fights his skill and courage were conspicuous. In Feb. he had a new force of 5,000 men, with whom he followed the Indians, who had made their final stand at Tohopeka on the Tallapoosa, on a small peninsula called the Horseshoe. The position was strong, but the Indian force was weak; Jackson captured the place Mar. 27, and of the 900 Indians 750 were killed, the white loss being 201. This defeat was the end of wars with the Creeks, and thereafter the Indians of Georgia and Alabama submitted to fate and removed to the territory set apart for them w. of the Mississippi. A few months later Jackson and col. Hawkins made with the Indians the treaty of fort Jackson, on which occasion the leading chiefs desired to present Jackson with a tract of nearly 6,000 acres of land, but congress would not permit him to accept.

May 31, 1814, Jackson was made a maj.gen. of the regular army, and was looked upon as the leader in the s. w. The British were preparing for a formidable attack upon Mobile, and thither Jackson went in July. The enemy were making free use of the Spanish port of Pensacola, where they arranged two expeditions against the United States, and at the same time stirred up the Indians of Florida (then belonging to Spain) to hostilities against the white settlements in Georgia. The Spaniards lacked the disposition even if they had the power to stop this abuse, as was shown when the English commander made his head-quarters in the mansion of the Spanish governor. Jackson determined to take possession of Pensacola, and wrote to Washington for permission, but it was six months before the answer came. He wrote a protest to the Spanish governor, to which no attention was paid. He then "took the responsibility," called upon his Tennessee veterans, and prepared to seize the Spanish port. He put a force into a small unfinished fort (Bowyer) on Mobile bay, under command of maj. Lawrence. This place the English attacked by sea Sept. 15, but they were driven off, losing one of their vessels and 72 men. At this time occurred an event for which Jackson received more censure than from all other acts of his life. There had been a mutiny among the Tennessee troops whereby Coffee's reinforcements had been delayed. Jackson hung six of the offenders, thereby ending mutiny in armies under his command. At length he was ready, and marched upon Pensacola with 3,000 men. Negotiations were proposed, but he was not there to talk; he took the place Nov. 6; the English blew up the fort that defended the harbor, went aboard their ships, and left the bay. Two days later he was again in Mobile, expecting an attack from the English. There being no prospect of such attack, he sent the greater part of his troops to New Orleans, and arrived there himself Dec. 2, 1814. The place had no defenses worth notice, and but for their proverbial slowness the English might have taken it almost without effort. Jackson knew they were coming, and made preparations for their reception. On the 14th the English seized five American gunboats and a schooner, clearing the course up the river to New Orleans; but they did not avail themselves of the advantage. On the 15th Jackson, who had already called out the entire militia, proclaimed martial law. He had a motley army, comprising a few regulars, militia from the neighboring states, privateers from Baratania, and one battalion of negroes. On the 16th the British

advances landed, and came within 9 m. of the city on the morning of the 23d. Learning the facts early in the afternoon, Jackson hastily gathered a force of 2,130 (of whom only 1800 were in the engagement), and with the assistance of a solitary schooner made an attack, the result of which, after a very sharp conflict, was decidedly to the advantage of the Americans. The advance upon the city was checked, and, had not large additions been made to the British force during the night, there would have been a substantial American victory. It is generally believed that this check, and the remarkable caution with which the British moved, saved New Orleans from capture. After that battle Jackson retired to a canal about 4 m. from the city, where he prepared for defense from whatever quarter an attack might come. Packenham arrived on Christmas day and made many changes in the disposition of the British troops. On the 28th he made an attack, but was repulsed. He made another effort on New Year's day, chiefly with artillery, and this was not only a repulse but a defeat. These results were due to Jackson's incessant activity, and the spirit which he had aroused among his men. He greatly annoyed the enemy by sudden attacks in the night, and by other means kept them in constant alarm. Jan. 12, 2,250 Kentuckians came to Jackson, but were of little use as their arms were delayed on the river. On the 6th the English gathered all their forces, including marines and seamen, the number being about 14,000, though English authorities declared that 8,000 was the right count, while they absurdly insisted that the Americans had 25,000. (Jackson had about 4,000 men.) The American line was on the left bank of the river in a very strong position; it was about 1700 yards long, and manned by 12 guns and 3,200 men. The handling of the guns under lieut. Armstrong (afterwards gen.) was most effective. In the first assault upon Jackson's line the British commander Packenham was killed, and another gen. mortally wounded. A second assault produced no impression, the well-directed fire of the Americans being too terrible to face. A battery near the river was captured by the English after the loss of three-fourths of the assailants, but it was quickly abandoned. The famous 93d Highlanders, who had won distinction in many parts of the world, lost half their number. After losing heavily and seeing no prospects of success, gen. Lambert, who had succeeded Packenham, proposed an armistice. But while the British had been so badly beaten before Jackson's line they had gained decided success on the other side of the river, from which position they might be troublesome. In granting the armistice, therefore, Jackson required that it should not take effect on the other side, nor should either party send reinforcements there. This was agreed to, and in doing so the English abandoned their only advantage. The armistice ended the attempt to capture New Orleans and control the great river. The British retired with a loss of about 2,000 in all; the loss on the other side was seven killed and six wounded. The battle of New Orleans, which crowned Jackson with fame, was fought Sunday, Jan. 8, 1815, some weeks after the signing of the treaty of peace at Ghent. The anniversary of the day was for many years celebrated with enthusiasm surpassed only by the rejoicings on July 4. Following the war there were many legal troubles in which Jackson was involved, the most notable of which was a fine of \$1000 for contempt of court, the contempt being the arrest of judge Hall during the time of martial law. Jackson refused pecuniary assistance and paid the fine. Nearly 30 years afterwards, and only a year before his death, congress refunded the fine with interest.

In April, 1815, Jackson was appointed commander-in-chief of the southern division, and congress voted thanks for his services. His next active work was in the Seminole Indian war, in the course of which occurred another of his acts which created no little excitement. At the Spanish fort of St. Marks, of which he had taken possession, was one Arbuthnot, a Scotchman, whom he arrested; and at Suwanee he arrested a native of the Bahamas named Ambrister. These men (British subjects) were tried by court-martial, and declared guilty of inciting the Indians to war and supplying them with arms, and the sentence of death was immediately executed. At the same time Jackson hung two Indian chiefs, and then seized Pensacola in spite of the remonstrance of the Spaniards. These proceedings created intense excitement in England; but after much angry correspondence there was a peaceable settlement. In congress Jackson's conduct was very generally condemned, but all attempts to pass a vote of censure failed. As for himself, at this time, he was in constant and towering passion. He believed that his action was in accordance with the desires of the administration, and the criticisms so freely made were as goads to his hot temper, carrying him so far that he threatened to cut off the ears of certain free-speaking senators. In 1819 Jackson went as far north as New York, and was well received, but with little cordiality. On the cession of Florida to the United States he was appointed governor, and during his brief term of office had some serious difficulties in consequence of the arrest of a judge for issuing a writ of *habeas corpus*. Efforts in congress to pass censure for this act were not successful. In 1822 he was offered but refused to accept the Spanish mission.

The Seminole war closed Jackson's military career, and with no inclination of his own he was again taken into political life. In 1823 the legislature of Tennessee elected him to the U. S. senate, and at the same time nominated him for president. (At that time all nominations for the chief executive office were made by caucuses of state legislatures.) At the election the next year there were four candidates who received electoral votes as follows: John Quincy Adams 84, Wm. H. Crawford 41, Henry Clay

37, and Jackson 99. No one having a majority the house of representatives elected Adams, and Jackson retired to private life. But four years afterwards he was supported by all the opponents of the administration, and elected by an immense majority—the vote being Jackson 178, Adams 83. The contest was one of the most personal and bitter in American political history. Mrs. Jackson died almost as soon as she knew of her husband's election.

Jackson's eight years' administration of the government was neither better nor worse than had preceded. The chief innovation was in the general sweeping of men out of office on account of their party opinions. Up to his time there had been few removals on such grounds; but he adopted gov. Marcy's doctrine that "to the victors belong the spoil of the vanquished," and it may be added that every party from that day to this has followed in his footsteps. The leading facts of Jackson's administration were the scandal concerning Mrs. Eaton, whereby the cabinet was broken up; the veto of the U. S. bank charter; the removal of the deposits of public money from that bank; and particularly the prompt and complete crushing of the contemplated secession of South Carolina in 1832. This movement was started in opposition to a high tariff, and Jackson himself was opposed to such a tariff; but he gave the South Carolinians to know, in language not to be misunderstood, that while the laws remained un repealed they should be enforced at any hazard. Before any serious acts had occurred the matter was settled through the influence of Henry Clay and others. During his second term Jackson was engaged in the "bank war." He ordered the secretary of the treasury to stop making deposits of public money in the U. S. bank and its branches. The cabinet were not favorable to such a policy, and Jackson put William J. Duane at the head of the treasury, but as he declined to do the required service he was displaced and Roger B. Taney was appointed. Taney obeyed Jackson's order, and in retaliation the senate refused to confirm his nomination as secretary. (He was subsequently made chief-justice of the U. S. supreme court.) Feeling ran so high in this bank war that the senate passed a resolution of censure on the president, a proceeding unheard of till then. In 1837 this resolution was by vote expunged from the record. The "bank war" closed in 1836-37; the old bank was not re-chartered; and after some time the independent treasury or "sub-treasury" was invented to take its place as a depository for public money. During Jackson's terms the national debt was entirely paid off; the Indians were removed from Georgia, and nearly all of them from Florida, although enough were left to make the second Seminole war; and two states, Arkansas and Michigan, were admitted to the union. The chief disturbing elements were the question of slavery and the great financial panic, which was just beginning when he left the chair in Mar., 1837. On quitting office he published a farewell address and retired to the Hermitage, where he passed the remainder of his life, always, however, taking a deep interest in public affairs. Dropsy was the direct cause of his death; but he had through life been suffering from various diseases, and to these circumstances his friends ascribed much of his irritability of temper. His honesty in intent and act was never doubted; with all his harshness he was charitable; and in his later years made a free and open profession of the Christian faith, which he had always intellectually accepted.

JACKSON, CHARLES, LL.D.; 1775-1855; b. Mass.; graduated at Harvard college, 1793; studied law with chief-justice Parsons, and commencing practice in 1796 at Newburyport, rose to a high rank at the bar. In 1803 he removed to Boston, where, associated with judge Hubbard, he had the most lucrative practice in the state, and was among the most distinguished of the profession. He was judge of the Massachusetts supreme court, 1813-24; a member of the state constitutional convention in 1820; appointed one of the commissioners to revise the state laws in 1833, and in 1838 published a *Treatise on the Pleadings and Practice in Real Actions*, a standard work on the law of property.

JACKSON, CHARLES THOMAS; b. Mass., 1805; studied medicine in Boston, and received his medical degree from Harvard college in 1829. In 1827-29, in company with Francis Alger of Boston, he made a mineralogical and geological survey of Nova Scotia, an account of which is contained in *Memoirs of the Am. Academy of Arts and Sciences*. He visited Europe in 1829, spending three years in study in Paris. In 1831 he made a pedestrian tour through central Europe. He was at Vienna during the prevalence of cholera, and assisted in the dissection of 200 bodies of the victims. In 1833 he began the practice of medicine in Boston, but relinquishing it, devoted himself to chemistry, mineralogy, and geology. In 1836 he was state geologist of Maine; in 1839, of Rhode Island; and in 1840, of New Hampshire. In 1837 he had a controversy with prof. Morse, claiming the invention of the telegraph. In 1844 he explored the wilderness on the southern shore of lake Superior, and (1847-49) was U. S. surveyor of mineral lands in Michigan. Dr. Jackson claimed to be the discoverer of anæsthetics, but his claims were disputed by Dr. W. T. G. Morton, and Dr. Horace Wells, which gave rise to a protracted controversy. A memorial signed by 143 physicians of Boston and vicinity, claiming for him the exclusive discovery, was presented in 1852 to congress. A committee of the French academy of sciences, about the same time investigated the matter, and decreed a prize to both Jackson and Morton. Dr. Jackson has received many

honors from foreign societies and governments. He has contributed valuable articles to the *American Journal of Science and Arts*, to the *Comptes Rendus*, and to the *Bulletin de la Société Géologique de France*. His geological reports and chemical reports for the U. S. patent office were also published, and a *Manual of Etherization*, 1861.

JACKSON, HENRY ROOTES; b. Georgia, 1820; admitted to the bar in 1840; was several years U. S. district attorney for the state; was col. of a regiment in the Mexican war in 1846; judge of the circuit court, 1849-53, when he was appointed *chargé d'affaires* at Vienna, remaining there as minister resident 1854-58. After the secession of Georgia he accepted the office of confederate judge for the state, which he resigned, and was made a brig. gen. in the rebel army. He was under Hood in Tennessee; captured at the battle of Nashville in 1864; taken as a prisoner of war to Johnson's island, thence to fort Warren, where he remained till the close of the war. In his early life he contributed to literary periodicals, and in 1851 published *Tullulah, and other Poems*.

JACKSON, JAMES; 1757-1806; b. Devonshire, England; removed 1772 to Georgia, and in 1776 took an active part in repelling the British from Savannah; in 1778 was made brigade maj. of the Georgia militia, and when Savannah, which he had defended, fell, he fled to South Carolina, and joined gen. Moultrie; in 1781 he was at the battle of Cowpens as brigade maj. to gen. Pickens. When Augusta was besieged he was put in command of the garrison after the expulsion of the British. After the war the Georgia legislature presented him a house and lot. In 1789 he was chosen governor, but declined; was a member of the first congress under the new constitution in 1789; was U. S. senator 1793-96; took part in framing the constitution of Georgia in 1798, and was governor 1798-1801. While in congress he opposed the bill for the suppression of the slave trade.

JACKSON, JAMES, LL.D.; 1777-1867; b. Mass.; graduated at Harvard college, 1796; studied medicine with Dr. Holyoke of Salem, and in London. Returning, he began practice in Boston in 1800. He was the first physician of the general hospital in Boston, which, with Dr. Warren, he established. In 1810 he was chosen professor of clinical medicine in Harvard university, and in 1812 professor of theory and practice. In 1835 he was made professor emeritus. He was several times elected president of the Mass. medical society. His principal productions are: *On the Brunonian System*, 1809; *Remarks on the Medical Effects of Dentition*, 1812; various articles in the *Transactions of the Mass. Medical Society*; *Syllabus of Lectures*, 1816; *Eulogy on Dr. John Warren*, 1815; *Text Book of Lectures*, 1825-27; *Memoir of his Son, James Jackson, Jr.*, 1835; *Letters to a Young Physician*, 1855. He contributed many articles to the Boston medical and surgical journals.

JACKSON, JOHN, 1686-1763; b. England; graduated at Cambridge; was rector of Rassington and master of Wigton hospital. He afterwards published many treatises advocating Arian or Unitarian tenets, and wrote against Collins and Tindal. In 1752 he published a useful work on chronological antiquities.

JACKSON, JOHN, 1778-1831; b. England; an eminent portrait painter. The son of a poor tailor, he attracted the notice of lord Mulgrave and sir George Beaumont by the great taste for drawing which he displayed; and leaving his father, to whom he was apprenticed, he removed to London, and through their favor studied at the royal academy. He soon rose to distinction as a portrait painter, and in 1817 became a royal academician. Visiting Italy in 1819 he was made a member of the academy of St. Luke at Rome. He is considered one of the ablest pupils of the Reynolds school. Though he painted with remarkable rapidity, his pictures show always a careful finish. He was a man of sincere piety, rejoiced in the success of other artists, and was ready to aid promising youth in their struggles with poverty.

JACKSON, JOHN, D.D.; b. London, 1811; graduated with high honor at Oxford, 1833; was rector of St. James, Piccadilly, in 1846; chaplain to the queen in 1847; canon of Bristol in 1852; bishop of Lincoln in 1853. In 1845, 1850, 1862, 1866, he was preacher before the university of Oxford; in 1853 delivered the Boyle lecture; and in 1869 was appointed bishop of London.

JACKSON, JONATHAN, 1743-1810; b. Boston; graduated at Harvard college, 1761; was a wealthy merchant at Newburyport; a member of the provincial congress in 1775; a representative in 1777; a member of the old congress in 1782; a state senator in 1789; marshal of the district of Massachusetts, state treasurer, and president of the state bank. He published *Thoughts on the Political Situation of the United States*.

JACKSON, PATRICK TRACY, 1780-1847; b. Mass.; brother of Dr. James Jackson; was apprenticed at the age of 18 to a merchant, and engaged afterwards in Boston in the Indian trade, in which he acquired a fortune. With his brother-in-law, Francis C. Lowell of Boston, he engaged in the cotton manufacture, and after several experiments succeeded in producing a model from which a power-loom was constructed in 1812 by Paul Moody. They built their first mill in 1813 at Waltham, the first that converted the raw cotton into cloth. In 1821 he purchased land on the Merrimack river, on which the Merrimack Manufacturing company erected a number of mills under his auspices. This was the site of the present city of Lowell. In 1830 he obtained a charter for a railroad from Lowell to Boston, which, under his direction, was completed in 1835. Having

experienced severe pecuniary reverses in 1837, he took charge of the Locks and Canal Co. of Lowell, and afterwards was agent of the Great Falls Co. at Somersworth, N. H. He took a deep interest in the moral and intellectual improvement of his operatives.

JACKSON, SAMUEL, 1787-1872; b. Philadelphia; was a distinguished physician, lecturer and writer. He was professor of the institutes of medicine, 1835-63, in the university of Pennsylvania. His most important work is the *Principles of Medicine*, 1832. He published also *Discourse commemorative of Nathaniel Chapman*, 1854; introduction to Morris's translation of *Lehman's Chemical Physiology*, 1856; *Occasional Essays*, 1872.

JACKSON, THOMAS, D.D., 1579-1640; b. England; graduated at Oxford, 1595; was president of Corpus Christi college in 1630, prebendary of Winchester in 1835, and dean of Peterborough in 1638. He was one of the most learned men of the 17th c. in theology, metaphysics, languages, the arts and sciences. He published a commentary on the apostles' creed, sermons and theological treatises. His complete works in 12 vols. were republished at Oxford in 1844. His writings are distinguished for elegance and dignity of style. Southey ranks him among the best of English divines.

JACKSON, THOMAS, D.D., 1783-1873; b. England; was for 20 years an itinerant Wesleyan preacher, and after editing the Wesleyan magazine by appointment of the conference for 19 years, became tutor in the Richmond Wesleyan theological institution. Of his numerous published works the most important are *The Institutions of Christianity*, 3 vols.; *The Centenary of Methodism; Life of Charles Wesley, and Contemporary Events*, 2 vols., 1841; *Providence of God Viewed in the Light of Scripture*, 1862; *Curiosities of Pulpit Literature*, 1868.

JACKSON, THOMAS JONATHAN (*ante*), 1824-63; b. at Clarksburg, Va., the third of four children of Jonathan Jackson, a lawyer, and his wife Julia Neale. The father died when Thomas was but three years old, and the mother, with three children, was left without means of support. She taught school and worked at sewing. After three years of widowhood she married a lawyer named Woodson. He was poor, and the children were parceled out among their uncles and aunts. Fourteen months after her second marriage Mrs. Woodson died. Thomas went to live with Cummins Jackson, an uncle, who acted the part of a father to him, and there the boy grew up to the age required for entrance to the national military academy, to which he was appointed in 1842. His appearance when he entered the academy is thus described: "A slender lad, who walked rapidly, with his head bent forward; a grave, thoughtful face, which gave him a dull look; but when any thing interested or excited him his form became erect, his eyes flashed like steel, and his smile—as sweet as a woman's—would illumine his whole face." He graduated June 30, 1846, with the usual rank of second lieutenant of artillery; the Mexican war had just commenced, and all the West Point graduates were ordered into active service, arriving before Vera Cruz, Mar. 9, 1847. After a siege of 20 days that city surrendered, and the little army under gen. Scott moved on towards the Mexican capital, defeating Santa Anna, at Cerro Gordo, and winning other victories at Contreras and Churubusco. At the latter place Jackson made his first military mark. The first lieutenant, then commanding a battery, was killed and Jackson took his place, behaving so gallantly that he was given the rank of brevet captain. After Churubusco gen. Scott defeated the enemy at Molino del Rey, and finally took the castle of Chapultepec, which was the last defense of the city of Mexico. In the assault on the castle Jackson showed the greatest courage and daring, for which he was warmly complimented by his superior officers. Soon after the capture of the city, Sept. 14, 1847, which put an end to the war, Jackson, now a major, was sent with his command to fort Hamilton, New York harbor, where he remained two years. Here he became absorbed in reflections upon religion, was baptized, and became an attendant of the Protestant Episcopal church. From fort Hamilton he was sent to fort Meade, near Tampa bay, Florida. Not long afterwards he was chosen professor of natural philosophy and artillery tactics in the Virginia military institute at Lexington. He resigned from the army in July, 1851, and accepted the professorship. A few months after settling at Lexington he joined the Presbyterian church, and took an active part in the usual religious work. Aug. 4, 1853, Jackson married Miss Eleanor Junkin, who lived only 14 months—just as long as his mother lived after her second marriage. In the summer of 1856 he traveled in England and on the continent. July 15, 1857, he married Mary Ann Morrison, daughter of Dr. Robert Morrison, a Presbyterian clergyman of North Carolina, and the pair settled down to a quiet life near Lexington, but soon to be disturbed by the coming rebellion. Jackson went with his state, and on April 22, 1861, became once more a soldier, joining the army of the rebellion under gen. Robert E. Lee at Richmond. He was made a colonel and put in command at Harper's Ferry, which place became the rendezvous for all the troops in the valley of Virginia. Jackson was soon superseded at Harper's Ferry by gen. Joseph E. Johnston, and was put in command of five regiments of Virginia volunteers, forming the body afterwards known as the "Stone-wall Brigade." The first work of importance done by Jackson in the war of the rebellion was the destruction of the works, locomotives, and cars of the Baltimore and Ohio railroad at Martinsburg; and on this performance he wrote the following noticeable comment: "It was a sad work; but I had my orders, and my duty was to obey. If the cost of the property could have been expended in disseminating the gospel of the Prince of

Peace, how much good might have been expected!" Jackson had a skirmish at Haines's farm, where he had two men killed and ten wounded, and then he fell back to join the main body of the confederates near Winchester. July 3, 1861, he was made a brigadier-general. In the battle of Bull Run Jackson had an active though not prominent part; prominent enough, however to secure his well-known *sobriquet* of "Stonewall," which came from a remark of gen. Bee, whom Jackson was supporting. Bee was in active engagement, and to encourage his men he pointed to his support ranged on a ridge near by and cried out: "There is Jackson standing like a stone wall; rally behind the Virginians." A moment later gen. Bee was killed. Immediately afterwards Jackson's force was engaged, whereupon he ordered, "Reserve your fire till they come within fifty yards; then fire and give them the bayonet; and when you charge, yell like furies." This is said to have been the origin of the afterwards well-known "rebel yell." After the Bull Run battle Jackson fell back beyond Centerville, and began to drill his troops; and, Oct. 7, 1861, he was raised to major-general, taking command under gen. Johnston. Early in 1862 Jackson had the principal command in the Shenandoah valley, and by the secrecy and swiftness of his many sudden attacks he gave the union commanders much trouble, especially in the daring raids made by col. Ashby's cavalry. Jan. 31, 1862, Jackson suddenly resigned in consequence of difficulties or jealousies with gen. Loring, but he was prevailed upon to withdraw his letter. When the series of engagements known as the "Seven days' battles" began, Jackson resumed active service under Lee, and with his command was prominent in the conflict at Cold Harbor, June 27, 1862, and at Malvern Hill four days afterwards. On Aug. 9 his command, having been ordered northward, engaged in the indecisive battle at Cedar mountain. Soon after this event Jackson's powers were enlarged, and he was given the command of almost the half of the confederate army of Virginia, being second in authority only to gen. Lee. Aug. 29 he was in command at the second Bull Run battle. Two weeks afterwards, by a wonderfully rapid movement, he captured nearly 11,000 union soldiers at Harper's Ferry; instantly ordered a forced march, and the second day afterwards arrived at Antietam in time to participate in the conflict at that place. His next active service was at the battle of Fredericksburg, Dec. 13, 1862, where his behavior secured for him the rank of lieutenant-general. A period of comparative rest followed until May 2, 1863, when with about two-thirds of the confederate army he marched rapidly 15 miles to near Chancellorville, and by a surprise turned the right of the union army, driving it back upon the main body. Jackson supposed the fighting to be over, and that he had won an important victory; but with an escort of a few men rode into a forest to make observations. He had ridden some distance beyond the pickets, when one of the party remarked that he ought not thus to expose himself, but he replied, "There is no danger; the enemy is routed." He soon became aware that he was near the union lines, and the party rode back towards their own forces. They were mistaken for union cavalry, and were fired upon by their own men; some were killed, some wounded, but for the moment Jackson escaped. He turned into a thicket and rode towards his lines, when his own men fired again, and he received three shots, one in the hand and two in the arm, one of the latter breaking the bone and cutting the artery two inches below the shoulder. After riding a short distance he was assisted from his horse and through the battle, which had recommenced on the part of the unionists and was raging furiously, he was with great difficulty removed to a safe place. The arm was taken off, but he was attacked with pneumonia and died on Sunday, ten days after receiving the wound. Jackson was a muscular man, fully six ft. high, with a clear or pale complexion, bluish-gray eyes, an aquiline nose, prominent chin, strong jaws, and a large skull, with high forehead. He was a man of intense convictions, of deep moral earnestness, and of exceeding vigor and promptness in action. A bronze statue of him was dedicated at Richmond, Va., in Oct. 1875.

JACKSON, WILLIAM; 1730-1803; a distinguished English musician; was liberally educated, and showing a strong taste for music, was placed by his father under the care of the organist of Exeter cathedral. At the end of two years he went to London, studied under John Travers, organist of king's chapel; returned to Exeter, became a teacher and composer, and in 1777 organist and master of the chorists of the cathedral. His songs, canzonets, and trios rank high in England. His *Six elegies for three voices* Dr. Burnet considered the best of his works. He published in 1782 *Thirty Letters on Various Subjects*, and in 1798 *The Four Ages, together with Essays on Various Subjects*. He was also a landscape painter.

JACKSONVILLE, the co. seat of Duval co., Florida, on the w. bank of the St. John's river, 20 m. from its mouth, at the e. terminus of the Jacksonville, Pensacola, and Mobile railroad, 165 m. e. of Tallahassee, and 155 m. s.w. of Savannah; pop. '74, 12,000. The streets cross each other at right angles. The city has 14 churches, 2 national banks, the Stanton institute, a high school, public and private schools, a Roman Catholic academy for girls, a hospital, 5 newspapers, and manufactories for lumber, moss, marmalade, and machinery. Its commerce is considerable. The exports are lumber, cotton, naval stores, sugar, fruits, fish, and vegetables. Steamers run semi-weekly to Savannah and Charleston, and river steamers daily to St. Augustine and Palatka. A bluff on the n.w. commanding a fine view of the city has some elegant residences.

JACKSONVILLE, a city and co. seat of Morgan co., Illinois; 34 m. s.w. of Springfield, 200 m. s.w. of Chicago, 90 m. n. of St. Louis; pop. '80, 11,009. It is at the junction of the Chicago and Alton with the Wabash railroad, and is the s. terminus of the Peoria, Pekin, and Jacksonville railroad. From this city the Jacksonville, North-western, and South-eastern railroad extends to Virden. This city contains 24 churches, 2 national and 2 private banks, a savings bank, 3 hotels, 4 newspapers, a free reading-room, a free library of 1600 vols., and a conservatory of music. It is distinguished for its educational and benevolent institutions. It contains Illinois college (Congregational), Illinois college for women (Methodist), Jacksonville academy for girls, a ladies' atheneum, a business college, a high school, and several graded schools. Here are the state institutions for the blind, insane, deaf-mutes, and idiotic. The Lutherans also have an orphan asylum and a retreat for the insane. The city has a woolen mill, a car shop, a foundry, soap factories, planing and flouring mills. The streets are wide and adorned with shade-trees, and the city is provided with gas, water-works, and sewerage.

JACK TREE, *Artocarpus integrifolia*, a native of the East Indies, now spread over most of the tropics. It is nearly allied to the bread-fruit and bears a fruit resembling that of that tree, though much larger. It is used as food in India, but has a disagreeable flavor. Its wood is of excellent character, and is much used for carving, scroll-work, and various fancy articles.

JACME, or JAYME, EN, I.; 1207-1276; b. Montpellier, France; was king of Aragon, and count of Barcelona. He is often called the conqueror from his having conquered the Moorish kingdoms of Majorca, Valencia and Murcia, and imposed tribute on some others. The title *en* is supposed to be of the same import as the modern *don*. An ancient account of his life and exploits appeared in a Castilian translation at Barcelona in 1848, but its authenticity is not fully established.

JACMEL, or JACQUEMEL, a sea-port t. on the s. coast of Hayti, on a bay of the same name, 30 m. s.w. of Port-au-Prince; pop. 6,000. Many of the streets are very narrow, and the houses mostly of wood. It has a commodious harbor for the largest vessels, but it is exposed to the s. winds and the heavy sea. It has a considerable trade with the United States, and the West India mail steamers stop here. The climate is hot and unhealthful.

JACOB (*ante*), as to his natural character, was significantly named "a supplanter." In his bargain with Esau he was unbrotherly and selfish in that, instead of gladly succoring his famished brother, he set a price on the nourishment which he had ready at hand, and that price extortionate—the birthright for a morsel of meat. He was guilty also in consenting to his mother's device for deceiving his father. Even his temporary opposition to it was not made on the right ground. Instead of refusing to do what was proposed because it was wrong, he objected to doing it only through fear of discovery, saying not, "I shall be a deceiver," but, "peradventure I shall seem to be." His execution of the plan involved him in many falsehoods. He said to his father, "I am Esau," though he was not; "I have done as thou badest me," though his father had not bidden him do anything, and he had not done what he said he had. He falsely claimed the help of God in what he said he had done. He aggravated the deception in adhering to it by presenting the skin of a kid as his own skin, and giving counterfeit venison as the true. He consummated the fraud by repeating to his still doubting father the declaration, "I am Esau," and by taking the blessing from him as if he were the older son. His subsequent dealings with Laban also were marred by crafty selfishness, even though he supposed himself driven to it in contending against equal selfishness on Laban's part.

The providential discipline by which Jacob's character was transformed was painful, varied, long continued, and quite in the line of his sins. His brother's anger compelled him to flee from his father's house; the exile which his mother hoped would continue only a few days was prolonged to 20 years; and when at length he was returning home, fear of his brother again filled him with distress. Having imposed himself on his father as the older son, he had an older daughter imposed on him for a wife instead of the younger whom he loved. Having been extortionate in his dealings with his brother and regardless of his exhaustion by the toils of the chase, he found his own wages changed ten times during a course of toil in which, as he said, by day the drought consumed him and the frost by night; and his sleep departed from his eyes. He was greatly afflicted by Rachel's death, was dishonored by the misconduct of his children, and endured years of anguish because of the absence and supposed death of his best-beloved son. During this course of discipline the care of God over him was manifested by the vision at Bethel when he went out from home, by the mysterious wrestling with him at the brook Jabbok on his return, and by the promise to be with him in the final journey of his life down into Egypt to see his long-lost son. After the darkness which had obscured so much of his career, caused chiefly by his persistent efforts to work out his promised destiny for himself, at evening-time with him it was light. The 17 years spent by him in the land of Goshen seem to have been irradiated with the graces of a humble and devout spirit, with an honored old age, and a prophetic insight into the glories of the future for mankind, his children, and himself. Having been chastened in the world, he was not finally condemned with the world. With all his disadvantages of nature and faults of character, rendering him far less attractive socially than his impulsive, careless, generous

brother, he had a nature more capable of development on the spiritual side, less controlled by appetite and by the present things of the senses, therefore more capable of being schooled into faith, and of being brought through painful discipline into a true manhood at last.

JACOB, LE BIBLIOPHILE. See LACROIX, PAUL.

JACOBÆAN LILY (AMARYLLIS FORMOSISSIMA). See AMARYLLIS, *ante*.

JACOB OF EDESSA, d. 708; an eminent Syrian theologian and writer who lived in the last half of the 7th century. In early life he entered the monastic order. He was appointed bishop of Edessa about A.D. 651, but resigning his office, he retired to a monastery in Toledo. Here he applied himself to the study of the Syriac version of the Old Testament, making many annotations, some of which are extant. He had a thorough knowledge of Hebrew, Syriac and Greek; and for his able translation of Syriac works into Greek he received the surname of *interpreter of the books*.

JACOB OF HUNGARY, named THE MASTER, was a religious fanatic in France during the 7th crusade, which in 1244 was headed by Louis IX, or St. Louis. St. Louis having been captured by the Mussulmans of Egypt, Jacob proclaimed through France a crusade for the liberation of the king. With 30,000 shepherds and peasants collected in Flanders, increased at Amilus to 100,000, he entered Paris, his followers committing outrages, killing the monks, and Jacob performing the rites of priest in the church of St. Eustache. Jacob having been killed by order of the queen, his followers were scattered.

JACOBI, ABRAHAM, b. Westphalia, 1830; graduated at the university of Bonn in 1851, and removed to the United States in 1853. He was professor of obstetrics and diseases of women at the New York medical college 1860-69, and afterwards at the college of physicians and surgeons. He published *Dentition and its Derangements*, and was editor of the *American Journal of Obstetrics and Diseases of Women and Children*. In this branch of medical science he has attained eminence; and recently he has published a volume on diphtheria, valuable as embodying the results of extensive and careful observation.

JACOBI, MARY PUTNAM, M.D.; b. London, 1842; daughter of George Putnam; since 1873 wife of Abraham Jacobi, M.D. Coming to New York in 1848 she was educated at the Twelfth street grammar school; then in the woman's medical college in Philadelphia; and graduated from the college of pharmacy in New York. In 1868 she went to Paris, and was the first woman admitted to the *école de médecine*, from which she graduated in 1871, receiving the second prize, a bronze medal. Returning to New York, she commenced the practice of medicine, and was appointed professor of materia medica in the medical college established by Elizabeth Blackwell, M.D., which position she now holds. She has published many papers in the *Medical Record* and the *Journal of Obstetrics*; and recently, in connection with V. A. White, M.D., has published *Cold Pack and Massage in the Treatment of Anamia*.

JACOBI, MAXIMILIAN, 1775-1858; a German physician, b. in Düsseldorf. After studying at Jena, Göttingen, Edinburgh, and Erfurt, he became assistant in a London hospital, and subsequently director of a lunatic asylum at Sulzburg. He favored non-restraint for the insane. In 1820 he took charge of the insane asylum at Siegburg. At a festival held in 1857 to commemorate the 50th anniversary of his doctorate, were present distinguished men from Germany, France, and England.

JACOBI, MORITZ HERMANN, 1801-74; a brother of Karl Gustav Jakob; b. Potsdam; was professor of civil engineering at the university of Dorpat in 1835; a member of the St. Petersburg academy of sciences in 1847. He distinguished himself by his researches in physics while in Russia. In 1832 he constructed an electric telegraph 18 m. in length between two of the palaces, and discovered by his experiments that the earth could be used to complete the electrical circuit. In 1837, simultaneously with Spencer of England, he invented the process of electrotyping. He contributed treatises on the applications of electro-magnetism to the academy of St. Petersburg.

JACOBS, PAUL EMIL, 1802-66; b. Gotha; a German painter; studied at Munich and Rome; resided in St. Petersburg, 1830-34. Returning to Gotha in 1840 he became court-painter to the grand duke, and died in his native city. His "Adam and Eve," "The Flight into the Wilderness," "Judith and Holofernes," "Samson and Delilah," were very popular, the last two receiving prizes in Philadelphia in 1850.

JACOBSON, WILLIAM, D.D.; b. England, 1803; graduated at Oxford in 1827; was vice-president of Magdalen hall, 1832-48; and then appointed regius professor of divinity. In 1865 he became bishop of Chester. He edited *Remains of the Apostolic Fathers*, 2 vols.; Nowell's *Catechism*; and the *Collected Works of Bishop Sanderson*, 6 vols.; and published two volumes of sermons.

JACOB OF VITRY; d. 1240; b. Vitry, France, in the last half of the 12th century. Attracted while a presbyter at Argenteuil by the sanctity of Maria of Ognies, he became her devoted disciple. At the request of the pope he preached against the Albigenses, and, finally enlisting in the enterprise of liberating the holy sepulcher, he went through France to levy contributions. He was made bishop of Acre in 1217 by Honorius III., and at his request went to the Holy Land. Here he baptized the children of the

Saracens which the Christians had taken, and intrusted them to the care of pious women. Resigning that see in 1225 he returned to Ognies, and was made by pope Gregory IX. cardinal and papal legate of France, Brabant, and the Holy Land. His work *Historia Orientalis*, or *History of Jerusalem*, is valuable. He published also *Life of St. Mary of Ognies*, sermons on the gospels and epistles, and several letters. He was an eloquent preacher.

JACOBY, JOHANN, b. 1805; a German physician; practiced in Berlin and Heidelberg. His political opinions made him notorious, and he was arrested four times upon suspicion, being accused of high treason. For his pamphlets, *Vier Fragen* and *Das Königliche Wort Friedrich Wilhelm III.*, he was pardoned; but for some later publications of his opinions he was imprisoned.

JACOBY, LUDWIG SIGISMUND, D.D.; b. Mecklenburg, 1811; was of Jewish parentage, but became converted to Christianity in early manhood. He came to America and entered the Methodist church as a preacher, 1840. He was active in establishing missions in both this country and Europe, and founded a theological college at Bremen. Returning to America in 1872, he became a pastor in St. Louis, Mo.

JACQUELINE OF BAVARIA; 1400-36; a Bavarian princess whose wealth made her a prize to be roughly contended for by contemporary princes. She was the only daughter of William VI. of Bavaria, and as a child was promised in marriage to prince John of France, but his early death, 1417, left her choice free. She rejected many suitors, amongst others the duke of Bedford, brother of the English king, and married John of Brabant. Tiring of him, she left him and went to England, where the duke of Gloucester obtained a papal dispensation to marry her, declaring her first marriage void. As soon as she was his wife he set out with 5,000 men to obtain possession of her estates, which had been seized by the neighboring princes; but Jacqueline was taken prisoner at Ghent, and having at last escaped to Holland, declared herself free of her marriage tie, and carried on the war for herself. Partially succeeding, she gave up her rights as heiress of Bavaria to the duke of Burgundy, in ransom of the third husband whom she had chosen, Francis of Borselen.

JACQUEMONT, VICTOR; 1801-33; was a French botanist and explorer, who in 1828 was selected by the French natural science committee to conduct a scientific survey of eastern Asia. Arriving in Calcutta the next year, he crossed the Himalayas, and reached Chinese Tartary, but, unfortunately, his premature death, upon his return to Bombay, put a stop to his researches.

JACQUES-CARTIER, a co. in Quebec, Canada, which comprises a portion of Montreal island. Pop. 11,179. Co. seat, Mount Claire.

JADE, or JAH DE, the name of a river, bay, and territory, in Prussia (Oldenburg), on the North sea, immediately w. of the mouth of the Weser. The river is navigable; it drains the district of Oldenburg, and empties into Jade bay. The bay originated in an inundation in 1511; when the sea, driven by a violent tempest, overflowed the land, covering a tract 74 sq.m. in extent. The territory of the same name covers one and one-third sq.m.; pop. '71, 3,789; and since 1873 has been incorporated into Hanover. The port of Jade is named Wilhelmshaven, and comprises a tract of land near the mouth of the river, purchased from Oldenburg by Prussia in 1853. It is an extensive naval station, and was opened by the king of Prussia in person, June 17, 1869. By an elaborate engineering system, including a canal and docks walled with granite, wharves, and extensive basins, the whole system being strongly fortified, this has been made one of the best defended and most important European stations.

JAFFNA (*ante*), a district comprising several islands separated by narrow creeks, which lies n. of the island, and is included in the province, of Ceylon. It is 40 m. long and 15 wide; its population about 148,000, of whom 650 are whites, mostly descendants of the Dutch and Portuguese, the former conquerors of Ceylon. It is now subject to the crown of England. The natives are of the Tamil race, and are said to have begun to emigrate from the continent previous to B.C. 101. They are mostly idolaters. With the whole of Ceylon Jaffna became subject to the Portuguese early in the 16th century. The Dutch took it from them in 1658, and the English conquered it in 1795. When the Portuguese held the district they baptized large numbers of natives, and some thousands still adhere to the Roman church. The American board and some English societies have sent missionaries there, and through their labors many have professed the Christian faith, and Christian truth has largely permeated the mass of the people. The entire district is but little elevated above the sea. Rice is cultivated on the lower lands, which are submerged during the rainy season. On the higher land are villages with groves of palms, cocoa-nut, palmyra, banana, areda-nut and other trees, fields of inferior grains, and gardens which yield yams, betel, tobacco, and various fruits. All these products require irrigation. The native name for Jaffna is *Yarlpalum*, from *Yarlpnan*, a performer on the lyre, by corruption *Yarlpna*, *Yapna*, *Japna*, *Jafna*. A tradition is held by the people to the effect that about 2,000 years ago a blind lyrist obtained, by his musical skill, from the king of Ceylon a grant of the district, and named it from his own profession; that he made himself king; but in the year of Thali, 3,000 (B.C. 101), he resigned in favor of a king of the Solen race from the Coromandel coast, and that.

*The descendants of this king reigned in Jaffna for 1400 years. There is said to be also an inscription in stone which relates that the lyrist, by the aid of 1000 men, transformed the district that was a sand heap into a garden by planting the various fruit trees which now abound. It, however, contradicts the legend in saying that in the year of Thali 3,000 he placed on his throne a son of the king of Ceylon.

JAFFNAPATAM, or **JAFFNA CITY**, is a fortified t. on an island forming part of a cluster of islands which lie n. of Ceylon, but which are usually designated as part of that island. The fort is small, but well built of blocks of white coral and is surrounded by a moat. Within it are a church in the shape of a Grecian cross, a fine house for the English commanding officer, and other English residences. The population of the town is about 4,000, natives, moormen, and whites, occupying distinct quarters. The streets are at right angles, between 40 and 50 ft. wide. The houses are of stone, white with chunam, having but one story, which is about 20 ft. in extreme elevation. Most of them have piazzas, and are surrounded with flowers, shrubbery, and shade trees. The town has a clean and neat appearance. There are manufacturers who produce various fabrics from the cotton of the cotton-tree; also artificers in gold, silver, and wood.

JAGGAR, THOMAS AUGUSTUS, D.D., b. 1839; bishop of the Protestant Episcopal diocese of southern Ohio. He graduated at the General theological seminary, N. Y., and took holy orders 1860. He is the founder of the Riverside hospital at Yonkers, N. Y.; was successively rector of Anthon Memorial church, New York, of St. John's, Yonkers, and of Holy Trinity, Philadelphia.

JAGGERNAUT. See **JUGGERNAUT**, *ante*.

JAH'DE. See **JADE**.

JAHN, FRIEDRICH LUDWIG, 1778-1852; an eccentric German, who was the first to introduce gymnastics into the Prussian army. His theories were fantastic and absurd, but he accomplished much by the increased attention which he invoked for physical education, especially for soldiers. He established schools for gymnastics, which became political centers; and although as long as war with France lasted, they served to increase the enthusiasm and patriotism of the people, when peace was finally concluded, Jahn, with his excited followers, was looked upon as a demagogue, and cited by the Prussian government as a stirrer up of the people. He was imprisoned; and was liberated only upon condition of never establishing himself in a university town. He settled at Freiburg, and devoted his energies to writing and publishing, becoming more exaggerated in his views and actions. In 1833 he was elected to the national assembly. His principal writings were: *Runenblatter*, *Neue Runenblatter Merken zum Deutschen Volksthum*, and *Die Deutsche Turnkunst*.

JAHN, OTTO, 1813-69; b. Kiel; studied under Lachmann and Gerhardt, at Berlin; lectured in his native town on archaeology and philology, and traveled in southern Europe under the pay of the Danish government. Being made professor of philology at Leipsic in 1847, he became involved in the revolutionary outbreak of the following year, particularly in the attempt to separate Holstein from Denmark, and was deprived of his position in 1850. He was appointed in 1855 professor of archaeology at Bonn. He devoted much time and thought to musical studies, and wrote a life of Mozart, which was published in 1856. He also wrote essays on philology and archaeology.

JAHR, GEORGES HENRI GOTTLIEB, b. Germany, 1801; studied medicine under Hahnemann, and became one of the most prominent professors of the homeopathic system. He wrote a number of works on special diseases and their treatment by the new practice, and his *Homeopathiæ Pharmacopœia* is considered a standard authority in that school. His works have been translated into French and English.

JAIL, or GAOL. See **PRISON**.

KAJOKERTA, JAKYOKARTA, or YUGYAKARTA, capital of the Dutch residency of the same name in Java; pop. 50,000. It is the seat of a native sultan, a Dutch resident and assistant resident, and has many Europeans. A curious feature of the town is the sultan's water-palace, built on a terraced island, with subterranean approaches, walls, and towers. It is falling into decay. The residents and the Europeans dwell in the fort, which commands the palace and town. There is a church, school, and shot-foundry. The sultan has a body-guard of young females.

JALISCO, an important Mexican state on the Pacific ocean, formerly the kingdom of Nueva Galicia; it now comprises 9 cantons, or districts; 48,967 sq.m., pop. '70. 966,689. The surface of the country is varied, chiefly mountainous, but in the valleys fertile and beautiful. It is well watered by a number of streams, the Lerma, or Río Grande de Santiago, 600 m. in length, being the largest. There are numerous lakes, of which the most important is Chapala, 90 m. long, and 10 to 35 m. wide. The volcano of Colima is about 12,000 ft. in height. Nearly all the tropical products can be grown in this province, sugar-cane, in particular, being very successful. It is also a rich mining country, but is little worked. The population is composed, mainly, of tribes of native Indians. Capital, Guadalajara.

JAMAICA, a village on Long Island, Queens co., N. Y.; pop. '80, 10,089; reached by the Long Island, South Side, and Brooklyn Central railroads from Brooklyn, and in favor with New York business men for suburban residence. It is a thriving place, depending in a considerable measure on its market gardening interest, and its contiguity to New York; but having also some important manufactures. A good library and public school system, an energetic fire department, 6 churches, an academy, banks, newspapers, etc., are its chief public institutions.

JAMAICA PLAIN, a village in Massachusetts, since 1874 incorporated (with West Roxbury) as the 17th ward of Boston; three miles distant from the city proper, with which it is connected by horse railroad. It is a thickly settled and attractive suburb, and a favorite place of residence with persons doing business in the city. It borders on Jamaica pond, a beautiful sheet of water whose picturesque shores are lined with elegant residences.

JAMALTI'CA, the locality of a group of ruins, situated 20 m. n. of Comayagua in Honduras, and exhibiting a series of mounds, whose summits are reached by flights of steps, above which are remains indicating the former presence of considerable edifices. The largest of these mounds stands in the center of a broad terrace, and the smaller ones are arranged at regular distances from it. Excavations in the surrounding country have brought to light many ancient vases and pieces of sculpture, which indicate, in the excellence of their workmanship, the existence of a high standard of art and a marked ability.

JAMES, a co. in s.e. Tennessee, on the boundary line of Georgia, with the Tennessee river on the n.w.; 290 sq. m.; pop. 5,000. The general conformation of the country is mountainous, containing coal and iron. The soil is fertile, and easily cultivated. This co. is intersected by the East Tennessee, Virginia, and Georgia railroad. Co. seat, Ooltewah.

JAMES VI. of Scotland. See JAMES I. of England, *ante*.

JAMES VII. of Scotland. See JAMES II. of England, *ante*.

JAMES, HENRY, b. Albany, 1811; pursued his studies at Union college and afterwards at Princeton. During his travels in Europe he became interested in the views promulgated by Robert Sandeman, whose work, *Letters on Theron and Aspasia*, he had edited for the American press. His religious views were peculiar, in that while he denied the doctrine of the Trinity he advocated belief in the deity of Christ. He made the acquaintance of Swedenborg, whose writings exercised a potent influence over his mind. In 1849 he delivered a series of lectures in New York, on *Moralism and Christianity*, which he afterwards collected and published in book form. In 1852 he delivered a second course of lectures, all of them inculcating the same views, namely the intrinsic difference between morality and religion in their relation to human existence. Among his works are *Lectures and Miscellanies; The Church of Christ not an Ecclesiasticism; The Nature of Evil; Christianity the Logic of Creation; Substance and Shadow; and The Secret of Swedenborg*.

JAMES, SIR HENRY, 1803-77; b. England; educated at Woolwich, and entered the engineering service of the government. He superintended a geological survey of Ireland in 1844, and the construction of the important works at Portsmouth two years later. In 1852 he was appointed chief of the ordnance survey, which office, with that of chief of the topographical and statistical departments of the ministry, he continued to hold until his death. He devoted much study to the subject of photographic printing, and devised a process which he called photozincography, a description of which he published in 1862. By this process he produced in fac-simile the *Domesday Book*, in 32 vols., and *National Manuscripts from William I. to Queen Anne*. He also prepared the *Ordnance Survey*, in Ireland, Scotland, and England and Wales; and wrote *Account of the Principal Triangulation of the United Kingdom*, and *Record of the Expedition to Abyssinia*.

JAMES, HENRY, JR., b. N. Y., 1843; son of the rev. Henry James, a Swedenborgian minister, formerly lived in Cambridge, Mass., though not a Harvard graduate. For some years he has resided in London. He commenced the career of a writer by contributing fiction to *The Galaxy*, a magazine formerly published in New York, afterwards consolidated with *Scribner's Monthly*. He contributed his first novel, *Watch and Ward*, to the pages of the *Atlantic Monthly*; and has since published *The Europeans; The American; Daisy Miller; An International Episode; The Diary of a Man of Fifty; Washington Square; A Bundle of Letters*, and other works of fiction; also *Transatlantic Sketches*, a volume of travels; *French Poets and Novelists*, in the nature of criticism; and *Hawthorne*, one of the series entitled *English Men of Letters*. His writings show careful training and delicate literary workmanship, and have had wide circulation; but with their undeniable excellencies, they have been criticised for lack of balance and perspective in characterization. In beauty and aptness of diction he is scarcely exceeded.

JAMES, THOMAS, an English explorer. In 1631 he undertook the search for the n.w. passage at the instance of a company of London merchants, and was accompanied by Luke Fox, the originator of the scheme. Leaving Deptford May 5, they reached Hudson's bay June 22, and proceeded northward until Aug., 1632, when they found

their passage blocked by ice in $65\frac{1}{2}^{\circ}$ n. lat. He named the southern portion of Hudson bay James's bay, and discovering land to the w., called it New Wales. Returning to London he published *The Strange and Dangerous Voyage of Captain Thomas James in the Northern Seas, for the Discovery of a North-west Passage to the South Sea*.

JAMES CITY, a co. in s.e. Virginia, bounded by three rivers, the James, the York, and the Chickahominy; 184 sq.m.; pop. '70, 4,425—2,440 colored. Its chief productions are wheat, corn, oats, sweet potatoes, and butter. Co. seat, Williamsburg.

JAMES, EPISTLE OF (see James, *ante*), is strongly attested as genuine by being in the Syriac version of the New Testament, made about the close of the 1st c. and in use near the region where the apostle James and his first readers lived. There are probable allusions also to it in the writings of Clement, who, about the same time, was bishop of Rome, and in those of Hermes of the 2d century. Origen, in the 3d c., and Athanasius in the 4th, quote it as genuine. Eusebius, in the 4th, classes it among the writings not unanimously received; says that some even regarded it as spurious, yet testifies that it was used by most of the churches; and in other passages, quoting it without hesitation, he speaks of it as Scripture, and of its author as the holy apostle. Jerome, in the same century, says that James wrote an epistle, which some regarded as the work of another person who had appended to it the apostle's name, but that gradually, as time advanced, its authority was established. When, in 397, the council of Carthage acknowledged it as canonical, it had become almost universally acceptable to the churches both of the east and the west. At the reformation, Luther at first, in the ardor of his zeal for the doctrine of justification by faith, misapprehending the epistle as though it contradicted the teachings of Paul, called it "strawy;" but afterwards in his mature judgment, perceiving that the contradiction was only apparent, he acknowledged its authority. The appearance of contradiction between Paul and James, on which so much stress has been laid, results from disregarding the different points at which their views of faith and works were taken. Paul first speaks of Abraham in his unrenowned state; James speaks of him after his experience of divine grace: Paul describes justification as the act of God; James looks on it as manifested to men: Paul declares that works wrought without faith are insufficient to procure it; James affirms that works wrought in faith are necessary to manifest it: Paul looks at Abraham's faith when first exercised and as known to God; James regards it after it had had its ultimatum in works that were visible to men. In other passages of Paul's writings, where his point of view is the same as that of James, he agrees perfectly with him, declaring it impossible that genuine faith should be without the fruit of good works, and bringing forward the works of Abraham and Rahab as the fruits of their faith, precisely as James does.

Analysis.—Part I. chap. i. exhorts Christians to practice joyful patience under trials; to seek wisdom from God with unwavering faith; to rejoice in poverty, because of the exaltation which the gospel confers; and in wealth, because of the discipline which it supplies; to remember that God is the author of nothing evil, but of everything good; to receive the word of God promptly and humbly, reducing it to practice, and under its guidance, persevering in a benevolent and pure life. Part II. (ii.—v. 6) censures the exhibition, in Christian assemblies, of greater respect for the rich than for the poor, declares that all profession of faith, however confident, which does not lead to good works is only a pretense which cannot justify a sinner; denounces ungoverned and malevolent speech as a source of great evils and in glaring contrast to the pure and peaceful wisdom which, coming from above, manifests itself in benevolent words and deeds; and condemns strife, immorality, pride, reckless pursuit of pecuniary gain, oppression of the poor, and luxurious living, as bringing the punitive judgment of God. Part III. (v. 7—20) exhorts again to patient waiting for the coming of the Lord, encouraged by the remembrance of the prophets and especially of Job; to reverent and careful speech; to confession and prayer, commended by the example of Elijah who, with a nature like that of other men, obtained signal answers to his prayers; and to zealous efforts for the conversion of transgressors, animated by the joyful hope of saving souls from death.

JAMES FRANCIS EDWARD STEWART. See STEWART, THE FAMILY OF, *ante*

JAMES ISLAND, one of the sea-island chain, famous for cotton, lies immediately s. of the Ashley river and the city of Charleston, S. C.; pop. 1808. Here, as was the case with all the islands in Charleston harbor, occurred many important incidents of the war of the rebellion.

JAMES, SAINT, LITURGY OF. See LITURGY, *ante*.

JAMESTOWN, a village in Chautauqua co., N. Y., at the outlet of Chautauqua lake. It is accessible by the Atlantic and Great Western, and Dunkirk, Allegheny Valley, and Pittsburg railroads. Pop. '70, 5,336. The chief industry is manufacturing, and there are a number of grist and saw mills, obtaining water-power from the outlet. It has 10 churches, and its educational facilities are important. Chautauqua lake is noted for the occurrence of the annual meetings of a number of religious and secular organizations, all of which have grown out of the foundation of the Chautauqua Sunday-school assembly and summer school, established in 1874. The association managing these meetings has erected a number of fine buildings, including a spacious

amphitheater, the whole lighted by electricity, and assigned and arranged for the accommodation of large numbers of people. Here gather annually, at midsummer, from 8,000 to 10,000 enthusiastic members of different religious organizations, while the Chautauqua literary and scientific circle, designed for the encouragement of home study, has its ramifications extending throughout the entire country. The responsible head of the various institutions here consolidated is rev. J. H. Vincent, of Plainfield, N. J. The grounds occupied by the association cover an area of 4,000 ft. in length by 2,400 wide at the widest part, forming an irregular parallelogram.

JAMESTOWN, the site of the settlement made in Virginia in 1607, the first in the United States by English settlers. At that time it was a promontory extending into the James river; but the action of the water has since made it an island, while the only remains of the original settlement are comprised in the ruins of the church, fort, and a few houses. The colony numbered 107 persons, under Bartholomew Gosnold, Christopher Newport, and the celebrated capt. John Smith; and was recruited in the succeeding years by new accessions, until, in 1619, it was a large and flourishing settlement, with a house of burgesses, the first appearance of an English legislative body in American history. During the Bacon rebellion of 1676, Jamestown was burned, and it was then suffered to remain in ruins. Gen. Wayne and lord Cornwallis fought an engagement here in 1781.

JAMI (ABDEKRAHMAN-BEN-AHMED), d. 1492; a Persian poet who is called after the place of his birth, Jami, in Khorassen. His writings are mystical, and he was always in high favor with the sultans of Herat, which was his place of residence. He was the author of many learned works in prose as well as verse, some of which have been preserved and translated into various European languages.

JAMIESON, JOHN, D.D. (*ante*), 1759-1838; b. Scotland. He took orders, and for some time officiated as minister in Forfar in connection with the Secession church. The latter half of his life was passed at Edinburgh, where he fulfilled the duties of his profession and wrote several able essays, amongst others, *Alarm to Great Britain, or an Inquiry into the Causes of the Rapid Progress of Infidelity; Vindication of the Doctrine of Scripture*, a reply to Dr. Priestly's *History of Early Opinions*. His most valuable works, however, were his *Etymological Dictionary of the Scottish Language*; and *Hermes Scythicus*, a treatise in which he traced the radical affinities of the Greek and Latin languages with the Gothic.

JANAUSCHEK, FANNY, b. Prague, Bohemia, 1830. She was devoted to the stage from childhood, and in her earliest years gave evidences of artistic talent. Her career as an actress began with much success at Cologne. From 1848 to 1860 she appeared in the principal cities of Germany. In 1867 she came to the United States, playing in New York and other cities, but exclusively in the German language. She was greatly pleased with the country, and determined to play here in English, which she did during the season of 1873-74, and in later years. She is an actress of great power, but lacks the finer touches of her art. She returned to Europe in 1878.

JANES, EDMUND STONER, D.D., 1807-76; b. Mass.; was educated in Conn., and studied for the bar, but became a Methodist itinerant minister, receiving his appointment at the Philadelphia conference of 1830. He advanced with great rapidity, preaching in Philadelphia and New York, and in 1840 became financial secretary of the American Bible society. In 1844 he was elected a bishop of the Methodist Episcopal church. At the time of his death Dr. Janes was the senior bishop of his church.

JANESVILLE (*ante*), a city in Rock co., Wis., 70 m. s.w. of Milwaukee; pop. '70, 8,789; deals extensively in horse-breeding and trading. It has large manufactories and public schools. It has excellent water power, owing to its situation on both sides of the Rock river. The state institute for the blind is situated here, the press is represented by a number of important publications, and particular attention is paid to the cultivation of musical taste and skill, for which there are several special schools.

JANET, PAUL, b. Paris, 1823; a prolific and learned writer. He was for some time lecturer on philosophy at Bourges and Strasburg, and became professor of the history of philosophy at the Sorbonne, 1864. He represents the modern French philosophic school, advocating the principles of Cousin, and promoting the freedom of examination demanded by the most recent psychologists.

JANOW, MATTHIAS VON, d. 1394; son of a Bohemian knight and one of the most distinguished reformers before the reformation. Of his early history little is known. He was educated at the university of Prague, and spent six years at the university of Paris. When quite young he was celebrated for his theological learning. Visiting Rome he was appointed in 1381 prebendary at Prague and confessor of Charles II., continuing to perform the duties of the office until his death. Though not an eloquent preacher, he was a man of spiritual power, and by his writings did much to purify the church from its corruptions. His works contain the germ of those Christian principles which were unfolded by Huss, and later in Germany by Luther. In his book *De regulis Veteris et Novi Testamenti*, he portrays the corruption of the church in all its parts, and explains the causes of it. He tries everything by the divine word, rejecting the authority of human tradition and papal decretals, and severely arraigning the conduct of bishops and priests. His writings show that he took higher ground than

Waldhausen and Milicz, the forerunners of Huss, and that he was in fact the Wycliffe of the Bohemian church. The pope declared him guilty of heretical teaching, and he was compelled to leave Prague. In 1410, 16 years after his death, his writings were burned with those of Wycliffe.

JANSSEN, CORNELIUS. See JANSSENS, CORNELIS J., *ante*.

JAPAN (*ante*). Native name Dai Nippon, or Nihon, from *ni*, sun, *hon*, root or rising; first bestowed either by the Coreans or the inhabitants of the south-western provinces—which were first peopled—and found in the native literature as early as A.D. 670. The Japanese empire comprises Chishima (Kurile islands), Yezo ("Jesso"), Hondo (Main island), Kiushiu (nine provinces), Shikoku (four provinces), the Riu Kiu (Loochoo) islands, and the islands lying off the western and eastern coasts, including the Bonin group—about 4,000 in all. From ancient times the empire has been divided into *do*, or circuits, after the Corean fashion, named as follows: "The home provinces," or Go Kinai, surrounding the *miako*, or capital, Kioto; Tokaido, east-sea circuit; Tozando, eastern-mountain circuit; Hokurikudo, northern-land circuit; Sanindo, mountain-back circuit; Sanyodo, mountain-front circuit; Nankaido, southern-sea circuit; Saikaido, western-sea circuit; Hokkaido, northern-sea circuit. These terms correspond to our eastern states, middle states, etc. In 1868 there were 84 *shuu*, or provinces, and 717 *kori*, or districts, each of the former having a purely native and a partly Chinese name, just as the eastern states are called "New England." Thus, Echizen is also called Eshiu, and Kaga, Kashi. In 1875 the empire was divided into 38 kens, or prefectures, governed by *rei*, or prefects, appointed from Tokio; with 3 imperial cities, or *fu*—Tokio, Ozaka, and Kioto—governed by *chiji*, or mayors. Yezo and Chishima are under the Kai Taku Shi, a special department. The official census of 1872, and again of 1874, gave Japan a population of nearly 33½ millions. The actual area of cultivated lands is: rice fields, 5,585,900 acres; of all other fields, 3,817,300 acres, on which the government tax collected was \$46,537,265. The total value of productions from agriculture, forests, and fisheries was \$276,303,903; of manufactures, including tea, tobacco, and all natural productions requiring manipulation, \$147,602,026, of mines and quarries, \$4,762,387; grand total, \$428,668,316. The foreign trade of Japan for the year ending Dec. 31, 1878, was: imports, \$33,334,392; exports, \$26,259,419; total, \$59,593,811, of which \$42,104,221 was shipped at Yokohama: 838 ships and 748,872 tons were distributed under the following flags: British, 487 ships and 417,691 tons; America, 180 ships and 212,266 tons; the others in order being German, French, Swedish, Danish, etc. In 1878, 2,477 Europeans and Americans resided in Japan; 1067 being British, 479 Americans, 300 Germans, 278 French, 105 Dutch, 95 Portuguese, and 209 of various countries, besides 3,028 Chinese. Since 1860 Japan has sold to foreign countries produce amounting to \$300,109,872, and received in exchange foreign merchandise amounting to \$323,037,581. American imports consist chiefly of cotton and woolen goods, machinery, metals, arms and ammunition, "notions," and petroleum, the latter article amounting in 1878 to \$1,856,881. Besides sailing vessels, two American steam lines ply between California and Japan. Nearly all the tea raised in Japan and exported is consumed in the United States. The chief exports are silk and silk-worms' eggs, tea, copper, tobacco, wax, camphor, coal, dried fish, rice, porcelain, lacquer, and other articles made by hand. The present internal and external condition of Japan can be best understood from a brief outline of the history of this island empire, whose development since 1868 has been one of the marvels of the century.—It is now well settled by students in comparative philology of the languages of Japan and Corea that the two tongues are closely affiliated, and that ethnically the Coreans are the nearest congeners of the Japanese. The ancient immigrants from the n. Asiatic mainland coming to the Japan archipelago found an aboriginal race, whose descendants are probably the Ainos of to-day, though in Kiushiu were some inhabitants of Malay extraction. The dominant race had their seat in Yamato, one of the central provinces near Kioto, and ruled the tribes subdued by them according to a rude feudal system, the suzerain of the tribe chiefs being the mikado. In the 5th c. the rudiments of Chinese-Corean civilization were introduced from Corea, with letters, literature, and the Confucian classics. In 552 A.D. Buddhist missionaries arrived from Corea. In the 8th c. the Chinese centralized system of government was copied by the Japanese, and ancient feudalism gave way to eight ministries or boards of government, the mikado sending out governors to the provinces from the miako or capital at Nara, and from 794 A.D. at Kioto. The dai jo kuan, or great council of the great government, superintended the eight boards, and was presided over by the senior premier, or dai jo dai jin (great minister of the great government), with three junior prime ministers, or *sa*, *u*, and *nai*, dai jin, or left, right, and inner, the mikado being supreme over all. From the most ancient times the mikado has ever been the central figure in Japanese politics, and though rival generals, ambitious premiers, and usurping military officials, called shoguns, or, since 1854, tycoons, have held at times immense power, and though to foreign eyes they have seemed to be "emperors," yet there never was but one emperor in Japan, and he was the mikado. The tycoon was never in rank or fact anything but a military commander. There have been four lines or families of shoguns ("tycoons"), the Minamoto (1192-1219), the Hojo (1219-1333), the Ashikaga (1333-1573), the Tokugawa (1603-1868), but there has been only one dynasty of mikados—an impe-

rial family having no names except the personal cognomen of each ruler. The line of mikados is the oldest dynasty in the world, the present sovereign, Mutsuhito, being the 133d of the line. The term mikado means great gate (similar to the terms sublime porte, pharaoh, etc.) or august place. In the 133 names on the list, none is repeated, though the same mikado has in several instances reigned twice. Nine of the line were females. Succession to the throne is not always to the eldest son, but to the nominee of the mikado among his children, or nearest relatives, or of the imperial household. The cadet families and offspring of the mikado not eligible to the throne form the court nobility called the kuge. Among the most ancient families were the Taira, Minamoto, and Fujiwara, whose descendants are still numerous. The two former increased to military clans, which, after two centuries of aspiring rivalry, finally came to blows in Kioto in 1156. At first the Taira (or Hei) family was in the ascendant, but in 1184 the Minamoto (or Gen), after repeated land battles, nearly annihilated the Taira in a great naval battle off Shimonoseki (see SHIMONOSEKI). Yoritomo, the head of the Minamoto, rebuilt Kamakura, a town near the modern Yokohama, in great splendor, and in 1192 received from the mikado the title of sei-i tai shogun—great rebel, subduing general. After the desecration of the Minamoto family in 1219, the Hojo family held the military power, which had now become a usurpation, the mikado having the name but not the actuality of power. The feudal system, which had been growing into form under Yoritomo, received immense development under the Ashikagas (who succeeded the Hojo), since they made the military magistracies, first established by Yoritomo, hereditary in the families of their own nominees. Nobunaga overthrew the Ashikagas, and partially subdued the empire, which had been long in a state of anarchy, in the name of the mikado. Nobunaga's work was taken up and finished by Hideyoshi, who, after unifying all Japan, which had been split into feudal fractions, parceled out his fiefs to military chieftains, without regard to the sovereign, by titles granted in his own name. In 1586, having attained to the office of dai jo dai jin, he retired in 1591 in favor of his son, and hence was called the taikō (great emeritus), or popularly, Taiko-sama. He sent an army of invasion to Corea (see COREA), which was withdrawn at his death in 1597. Iyeyasu, the founder of the Tokugawa line, succeeded Hideyoshi after the decisive battle of Sekigahara, and followed out the precedent of Taiko-sama in bestowing fiefs in his own name. Since he ruled the country with a firm hand, and all men saw in him "the man on horseback" that could keep in check by his iron hand the turbulent daimios, the mikado bestowed on him the title of sei-i tai shogun in 1603. Establishing his seat of government at Yedo, this once obscure village became a colossal city within two generations. Kioto was the city of the mikado, the throne, and the imperial court. Yedo was the city of camps. Kioto was the source of all power; Yedo was the place of its execution. Fifteen Tokugawa shoguns ruled from 1603 to 1688. The first shogun ever styled "tycoon" in official documents was Iyesada (1853-58), under whom the treaty with the United States was made. The wondrous growth of events whose fruits have been the revolution of 1868, and the radical alteration of the foreign policy of the empire, had its roots in the revival of the study of the ancient history, language, and religion, beginning over 160 years ago. The incoercible reverence of the people for the mikado, the long-slumbering hatred of the usurping Tokugawas among the subject daimios, the opening of the eyes of scholars to the fact that the Yedo military rulers were usurpers, and that they had further insulted the mikado by signing a treaty in which "the land of the gods" was opened to foreigners, and the hateful title of tycoon (anciently a title of the mikado) officially used by the servant of the sovereign, roused the nation to a pitch of wrath that finally broke out in the *coup d'état* in Kioto, Jan. 3, 1868, and the battle of Fushimi, Jan. 27. By these two measures the office of shogun was abolished, the Tokugawas took their true places as vassals, and the ancient government, in vogue from the 8th to the 12th c., was restored, the mikado being sole ruler, aided by the dai jo kuan and the eight boards of government. The national capital was changed to Yedo, henceforward named Tokio, and officially and popularly so-called (except in unrevised encyclopædias and foreign documents, in which precedent and not fact is followed). Finding it impossible to drive out the foreigners, as many of the patriots desired, the new government ratified the treaties, and thenceforward followed in quick succession those radical changes in the national policy which make Japan the wonder of nations. The feudal system, after seven centuries' existence, was abolished in Aug., 1871, and the daimios made to reside as pensioners in Tokio. The mikado appeared in public as the active patron of the dock yards, light-houses, hospitals, schools, colleges, railways, and telegraphs, which were rapidly established. An embassy headed by the dai jin Iwakura and four cabinet ministers, with over fifty attachés, started on a tour around the world, accredited to the treaty powers, with the special object of getting the extra-territoriality clause removed from the treaties, and to study the methods and resources of modern civilization. The embassy was absent nearly two years, and cost Japan \$750,000. In 1872 Japan gave the death-blow to the "coolie" trade by releasing the Macao Chinamen from the Peruvian ship *María Luz*. Two legations and three consulates were established abroad. These diplomatic foreign establishments of Japan now number about twenty. The newspaper press was established, there being now over 200 printed in the empire. The national banking and postal system were founded on the American model; 200 national banks exist in Japan from the Riu Kiu islands to Yezo. In 1877,

38,321,971 letters, postal cards, and newspapers were carried in the Japanese mails. Japan is now a member of the international postal union, and her stamps and cards are exchangeable in all countries of that union. The post-offices for foreigners at her treaty ports are also under her charge. Postal savings-banks are numerous and well patronized. A mercantile marine training school and a marine board of examination and license of competent masters, engineers, and pilots is connected with the postal department, which owns a fine fleet of steamers. The mercantile marine of Japan consists of about 100 steamers and 5,000 junks. The national navy consists of 5 ironclads built in England, and 10 wooden vessels, with a number of dispatch boats, etc. The naval department is equipped in first-class style for theoretical and practical work, with colleges, schools, bureaus of hydrography, dock-yards, stations, etc. The naval force, including marines, numbers 7,000 men. The army, on a peace footing consists of 31,680 men, and on a war footing, 50,250, of all arms of the service. The soldiery and peasantry, who since the middle ages had been separated, were amalgamated by the military law of Dec. 28, 1872, by which 6,000,000 males are enrolled as possible soldiers. The military resources of the mikado's government have three times been put to the test by revolts in Kiushiu headed by men dissatisfied with the policy of the government. The great Satsuma rebellion led by Saigo Takamori, which began Feb. 1, 1877, was put down only after seven months of hard fighting; 39,760 rebel troops were engaged, of whom 3,533 were killed, and 4,344 wounded; the imperialists losing probably 10,000 in killed and wounded, out of a force engaged of over 50,000. This civil war greatly added to the national debt, which now amounts to \$349,826,662, a large part of which accrued by the assumption of the daimio's debts, and by the cashing of the hereditary pensions of the samurai or gentry. In almost all the features of modern national life and civilization, Japan is, in outward form at least, rapidly coming abreast with most of the Christian nations. The presence, operation, and wonderful success of Christianity in its three forms, Greek, Roman, and Protestant, in Japan, together with the moral reforms instigated and carried out by the government and individuals, bid fair to infuse within the ribs of outer appearance the real life and soul of genuine Christian civilization. For further details, and the exposition of ideas, facts, and principles as embodied in the lives of men and the history of places, see the various titles in this work which refer to Japanese subjects. Besides the standard works on Japan written before the recent opening of the country to foreign life, see *Japan*, by Walter Dickson; *History of Japan*, by F. O. Adams; *The Mikado's Empire*, by W. E. Griffis; *Progressive Japan*, by gen. Legendre. On Japanese art, see Jarves's *A Glimpse at the Art of Japan*; *Art and Art Industries of Japan*, by sir R. Alcock; *A Grammar of Japanese Ornaments*. The best works on the language are: Grammars—S. R. Brown's *Colloquial Japanese*; Astor's *Grammar of the Written Language*; Satou's *Kuwaire Hen*; Brinckley's *Self-Instruction for Japanese*; Hoffman's *Japanese Grammar*. Dictionaries—J. C. Hepburn, LL.D., *Japanese-English and English-Japanese*, and pocket edition of same; *English Japanese Dictionary*—by Ernest Satou and M. Ishibashi.

JAPAN CLOVER, a leguminous plant, *Lespedeza striata*, a native of China and Japan, brought to the United States probably about 1850, and has spread with great rapidity in various parts of the southern states, especially on light, sandy soils. It is a perennial plant from a foot to 20 in. high, bearing trifoliate leaves, in the axils of which are small flowers which develop into a small one-seeded pod. It is much liked by cattle, especially the young plants; but the old plants contain considerable woody fiber. Agriculturists differ in opinion as to its merits as a fodder, but the weight of testimony is in its favor.

JAPYGIA. See APULIA, *ante*.

JARROW, or YARROW, a t. in the co. of Durham, Eng., situated on the Tyne, and of importance for its manufactories and ship-yards; pop. 18,179. The old church of St. Paul possesses a chair which is said to have been used by the venerable Bede, who was buried in the churchyard, although later his bones were removed to Durham, and placed in the same coffin with those of St. Cuthbert.

JARVES, JAMES JACKSON, b. Mass., 1818; educated in Boston, but unable to go through a university course on account of impaired eye-sight. Having been appointed U. S. consul to the Sandwich islands, he resided at Honolulu for a number of years, and established the first newspaper, the *Polynesian*, ever published there. He made an extensive tour through California, Mexico, and Central America, and also visited Europe. He did not, however, leave the Sandwich islands permanently until 1848. In the mean time he published several works which attracted attention, being written in a free and graphic style, while conveying much interesting information. These were: *History of the Sandwich Islands*, 1843; *Scenes and Scenery of the Sandwich Islands*, 1844; *Scenes and Scenery in California*, 1844. He also published, in 1855, *Parisian Sights and French Principles*, a series of brilliant and characteristic sketches. Mr. Jarves's *Art Hints*, which he afterwards enlarged and republished as *Art Studies*, was the first of his contributions to the literature of the fine arts. Having devoted himself to the collection of paintings illustrating the early schools of art in Europe, in a sequence, he was successful in bringing together a large number of fairly illustrative works, beginning with the Byzantine and reaching down through the middle age Italian, and the later French, Flemish, and

Spanish schools. This collection, or such examples from it as were not privately disposed of, was deposited in the fine art gallery of Yale college. Since 1862 Mr. Jarves has resided in Florence, where he is recognized as a keen, skillful, and experienced art critic. His later publications have been the *Art Idea* and *Art Thoughts*.

JARVIS, ABRAHAM, D.D., 1739-1813; graduated at Yale, and was ordained in England by the bishop of Carlisle in 1764, becoming soon afterwards rector of Christ church, Middletown, Conn. He succeeded bishop Seabury as bishop of Connecticut, 1803. His work was important in the early history of the Protestant Episcopal church in Connecticut.

JARVIS, EDWARD, b. Mass. 1803, graduated at Harvard university. He was educated for the medical profession, and practiced for many years in Dorchester, Mass. He interested himself in the collection of vital statistics, and has written reports and monographs on various departments of this subject, among which are *Physiology and Health; Elementary Physiology; Reports on the Number and Condition of the Insane and Idiots in Mass.* He was for many years president of the American statistical association.

JARVIS, JOHN WESLEY, 1780-1840; b. England; was nephew of John Wesley, who took charge of him in infancy, on account of his father's frequent and prolonged absences, as a sea-faring man. At the age of 5 he accompanied his father on a voyage to America, and was left by him in Philadelphia. While obtaining a very meager education, he displayed at an early age remarkable talent for drawing, which decided his future career. He worked as an engraver in New York, painting profiles on glass in his spare time, and eventually became successful and popular as a portrait-painter in oil. He painted portraits of Hull, Perry, Bainbridge, Robert Morris, and other prominent men of his time, which are now in the city hall, New York, and the gallery of the New York historical society. He painted also in New Orleans and other southern cities, gaining great popularity, which would have become an established reputation but for his convivial and irregular habits.

JARVIS, SAMUEL FARMAR, D.D., LL.D., 1786-1851, son of bishop Abraham Jarvis. He graduated at Yale, was ordained 1810, and became a priest in the following year, and rector of St. James's church, New York, in 1813. He was also professor of biblical criticism in the General theological seminary of the Protestant Episcopal church. He removed to Boston in 1820, where he was rector of St. Paul's church for six years, at the end of which time he traveled in Europe, visiting Italy, and remaining for some years in that country. He was a student of the eastern languages, and upon his return from Europe, accepted the chair of oriental literature, in Trinity college, Hartford. He was appointed historiographer of the American Episcopal church in 1838, and published *A Chronological Introduction to the History of the Church*. He wrote also, *No Union with Rome; The Church of the Redeemed; Sermons on Prophecy; and A Discourse on the Religion of the Indian Tribes of North America*.

JASMINE, or JESSAMINE (*ante*), one of the finest green-house species of jasmine is the *J. grandiflorum*, called in Europe Malabar jasmine, and in America Catalonian jasmine, easily trained upon trellises, and producing very fragrant flowers, with a pinkish tinge on the exterior, from which the oil may be obtained by the process of fatty absorption. The hardest species is *J. nudiflorum*, whose yellow flowers appear early in the spring, but they are devoid of odor. One of the most fragrant species is the *J. odoratissimum*, which bears yellow flowers. The *J. sambac*, of which the florists have several varieties, is a very fragrant species, much sought for by bouquet makers. The jasmynes are propagated by cuttings, in the manner of other green-house shrubs. The leaves of the *J. floribundum* are used in Abyssinia as a remedy for tape-worm.

JASMINE, or JESSAMINE, CAPE, a name popularly applied to plants belonging to the genus *Gardenia*, not related to the true jasmynes. They belong to the madder family (*rubiaceæ*), and are tropical and sub-tropical shrubs. The genus was named by Ellis for Dr. Garden of Charleston, S. C., who was a correspondent of Linnæus. The best known species is *G. florida*, brought to England from China (not from the cape) in 1754. A double variety is a very popular greenhouse plant, and is common in the southern states as a hardy out-door plant. It bears a large, oblong, orange-yellow berry, which is said to be used in China as a dye.

JASMINE, or JESSAMINE, CAROLINA, or YELLOW, a climbing plant growing in Virginia and southward, clambering over trees and fences, bearing in profusion yellow, funnel-shaped flowers, an inch in diameter, and having a fragrance similar to that of the true jasmine, the odor, on a damp evening or morning, being almost overpowering. This plant is the *gelsemium sempervirens*, belonging to the family *loganiaceæ*. It has been recently used as a sedative, in medicine.

JASON, known as the tyrant of Pheræ, lived in the 4th c. B.C., and was assassinated in 370. He sought to reduce all Thessaly to submission, and was successful in conquering the chief cities. Created dictator of Thessaly, he entered upon a successful warlike career, and, had he not been cut off when at its height, would doubtless have achieved a lofty reputation as a general, rivaling even that of Philip of Macedon, whom he resembled in the comprehensive nature of his ambitious designs.

JASPER, a co. in n.e. Georgia; 400 sq.m.; pop. '80, 11,849; is a rich agricultural district, though hilly, and produces corn, tobacco, and cotton. It has valuable mineral resources, particularly iron and gold. The Ocmulgee river forms its northern boundary, and it is watered by Cedar and Rocky creeks. Capital, Monticello.

JASPER, a co. in s.e. Illinois; 484 sq.m.; pop. '70, 11,234; is largely formed of prairie land, the soil being fertile and productive in wheat, Indian corn, and oats. The St. Louis, Vandalia and Terre Haute railroad to the Indiana state line crosses its n.w. corner. It is watered by the Embarras river. Capital, Newton.

JASPER, a co. in n.w. Indiana, having the Kankakee river for its northern boundary; 675 sq.m.; pop. '70, 6,354; is also watered by the Iroquois river. It is comprised, mostly, in prairie and marsh land, excellent for pasturage, while much of it is heavily wooded. Its productions are wheat, Indian corn, oats, hay, and potatoes; and there is a considerable and growing dairy industry. Capital, Rensselaer.

JASPER, a co. in s.e. central Iowa, watered by the Skunk river and its n. fork; 720 sq.m.; pop. '70, 22,116; is undulating in prairie and woodland, and has rich coal deposits. The soil is fertile, and it produces very largely of Indian corn, wheat, oats, and potatoes, and has valuable dairy industry. Capital, Newton.

JASPER, a co. in s.e. Mississippi, watered by the Leaf river and its affluents; 650 sq.m.; pop. '70, 10,884—4,898 colored; has undulating surface and fertile soil, and produces cotton, corn, and sweet potatoes. It is rich in cattle, horses, sheep, and swine. Capital, Paulding.

JASPER, a co. in s.w. Missouri, on the border-line of Kansas; 550 sq.m.; pop. '80, 32,021—772 colored; is watered by the Spring river, and has a fertile soil, productive of wheat, Indian corn, oats, and potatoes. This county has also a large dairy product, and some manufactures. Capital, Carthage.

JASPER, a co. in s.e. Texas, having the navigable rivers Neches and Angelina on the w.; 918 sq.m.; pop. '80, 5,778—2,538 colored; chiefly pasture land and timber, but produces rice, cotton, tobacco, Indian corn, and sweet potatoes. Capital, Jasper.

JASPER, WILLIAM, 1750—79, enlisted as a sergeant in a South Carolina regiment at the beginning of the American revolution, refusing a commission on account of his defective education. At the attack on fort Moultrie, June 28, 1776, Jasper distinguished himself by recovering, through an act of personal bravery, the colors of the defenders of the fort, which had fallen outside and were in danger of capture. On another occasion, aided by but one other person, he captured an entire British guard of 10 men, setting free the patriot prisoners whom they were conducting to Savannah. His daring act in this instance was recognized by the presentation, on the part of gov. Rutledge, of a handsome sword. Jasper fell mortally wounded at the assault on Savannah, while bringing off a stand of captured colors.

JATS, or **JAUTS**, the name of a people of Hindustan, first mentioned in history at the beginning of the 11th century. They opposed the invasion of Malmoud the Gazne vide, and are said to have gathered a fleet of as many as 8,000 boats in the Indus, where they were attacked by the invader and completely defeated. In the reign of Aurungzebe, the Jats appeared as banditti in the mountains in the interior of India. They increased in strength and daring, until they finally became formidable, and under their chief, Sooraje Mull, even dictated the policy of the Mogul court. The invasion of northern India by Ahmed Shah, sovereign of Cabul, put an end to the prestige of Sooraje Mull, who, after allying himself to the Mahrattas, deserted them before the battle of Panniput, and joined Ahmed Shah. His services on the occasion of this battle were rewarded by the possession of Agra and its district. At the time of the establishment of British power in northern India, the since celebrated Runjeet Singh was rajah of the Jats, and by a treaty with lord Lake, was permitted to remain in control of his territories without paying tribute. Disagreement between the English authority and that of the rajah brought about a conflict, and early in 1826 the almost impregnable fortress of Deeg, the stronghold of the Jats, was invested by a large force of British soldiers under lord Combermere. On Jan. 18 the fortress was stormed and captured, and the power of the Jats was at an end.

JAUJA a city in the department of Jumin, in Peru, is 108 m. n.e. of Lima; pop. 15,000. Until 1535 it was the capital of the vice-royalty of Peru. It is so beautiful in its position and surroundings that it is esteemed in that part of South America as an earthly paradise. The province of Jauja contains valuable silver mines.

JAUNDICE (*ante*). In the diagnosis it is noticed that the color of the skin in a sick person sometimes becomes so yellow or brownish-yellow as to lead to a belief in the reabsorption of bile, which is not the fact. The white of the eye is always more or less yellow in jaundice. In forming an opinion as to whether the hepatic disturbance is abating, as it must do before the jaundice diminishes or the discoloration of the conjunctiva begins to disappear, the sum of the symptoms must be taken into consideration, and particular attention must be paid to the examination of the feces. Traces of bile, or rather of some of its constituents, particularly the coloring matter, or biliverdine, can usually, though not always, be detected when the liver is resuming its functions, or at

least when the bile is flowing into the intestinal canal; therefore a reliance upon this test alone would sometimes lead to fallacy and the continuance of remedies no longer necessary, or perhaps injurious. The diagnosis in regard to the resumption of the hepatic function of biliary secretion must take into consideration the physical examination of the hypochondriac region, and the general character of any alterations in the character of the feces, and the sensations of the patient. See LIVER.

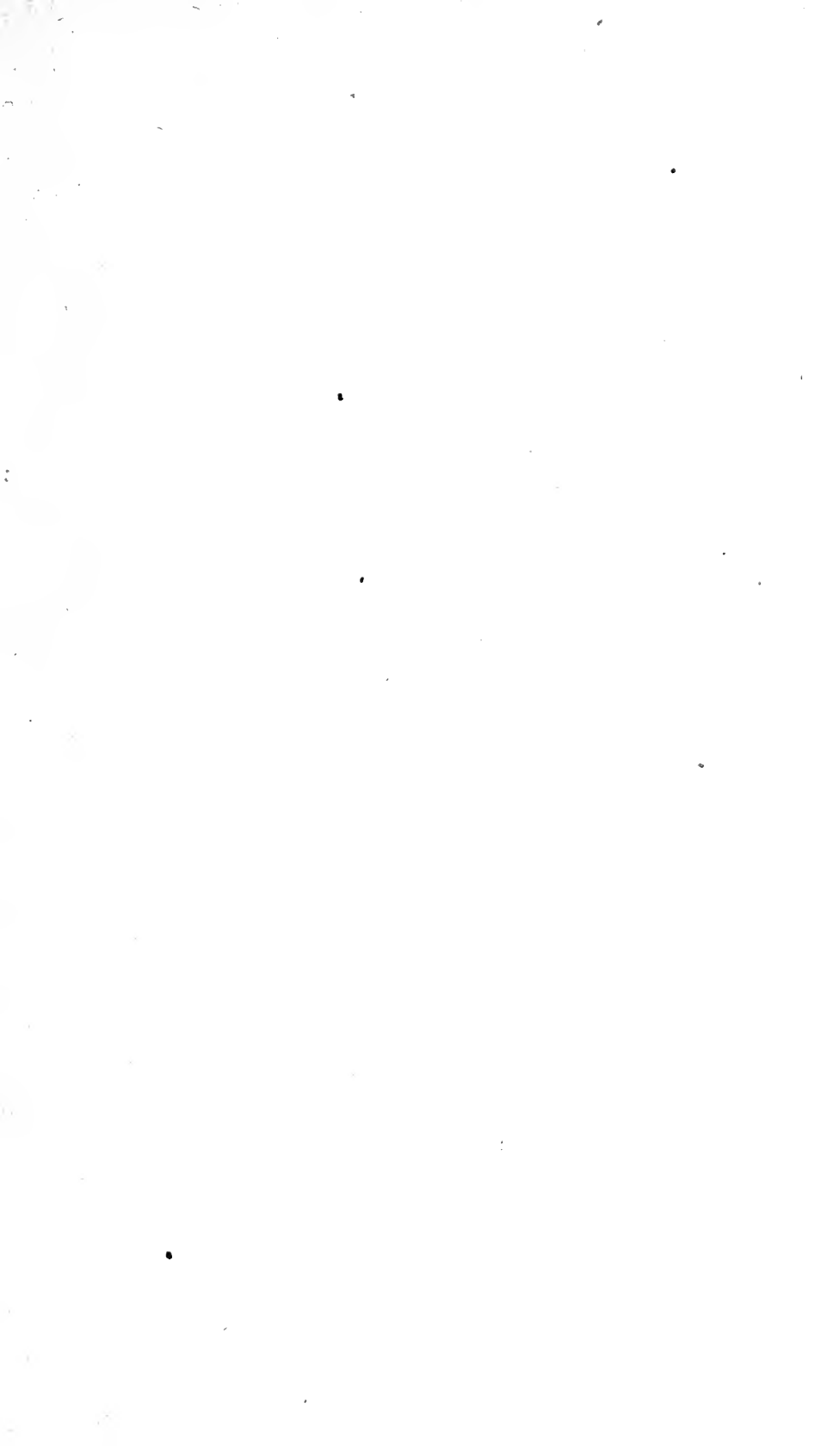
JAVANESE LANGUAGE AND LITERATURE. Two languages, possessing many words in common, but differing in essentials, are spoken in Java, the Javanese and the Sunda. From the earliest times Javanese has been a written language, and its alphabet has extended to the Sunda language. Inscriptions on stone and metal are in existence, which date back to the 12th century. The early characters differ from those now in use, but not more than black letter from modern type. They are in every particular dissimilar from those of the Hindu or Archipelagic alphabets. They appear to be entirely original, invented by the inhabitants themselves. In the Javanese grammar the consonants alone are considered substantive letters, the vowels being merely intended to modify, or, as the people themselves say, "clothe" them. There are 19 consonants, but the vowel *a*, as an initial, is considered a substantive letter. The same vowel is included in every consonant, and follows every one also, unless a contrivance is employed to cut it off. Apart from *a* there are 5 other vowels. Every sound in the language has its representative character, and each letter has its own peculiar power, and no other.

The foreign elements in the Javanese languages are: Sanskrit, Arabic, Tâlugu, or Telinga, which have become incorporated with it, not by foreign conquest or intermixture of race, but through religion and commerce. Of these, Sanskrit is the predominant. We have no clue to the influx of the Hindu sacred language into the Javanese tongue, but it must have been incidental to the conversion of the Javanese to Hinduism, and probably of very great antiquity. There are three dialects of the Javanese language: the vulgar, the polite, and the ancient or recondite. It is far more polished than the Sunda, which, although now written in the Javanese with the omission of the palatal *d*, and *a t*, had formerly a character peculiar to itself. The Javanese boast a very considerable literature in both the modern and the ancient tongues. In both it is metrical, the ancient showing many indications of Sanskrit poetry; and the modern abounding in stanzas of various kinds, and in a peculiar rhyme, which are entirely original. Romances and romantic histories are very popular; and abstracts of the Sanskrit poem which describes the wars of the Pandus and the legends of Rama are to be met with. These are to the Javanese mind what Homer's poems were to the Greeks. Original Javanese poetry possesses little originality or force, but it is superior to that of any other people of the Archipelago. Oriental scholars are interested in the prevalence of Indian legends. The *Ramayana* is identical with the *Ramajana* of the Hindus, and in their *Gastra manava* we recognize the fundamental principles of Mannus's book of laws. Several books have been translated into Javanese, amongst others *The Thousand and one Nights*. There is a Javanese newspaper. One peculiarity of the language should be noticed, it affords special forms and flexions for addressing particular persons, having regard to their rank. In speaking to servants, the mode of addressing them is called *basa noko*, or simply *nôkô*, or commanding; and in speaking to superiors, the servants in turn use *basa krama*, or *krama*, humble speech. Then, for those who occupy no especial position, there is the *basa madya*, or middle speech; and lastly the *basa kraton* or court language is used to kings or their envoys.

JAY, a co. in e. Indiana, watered by the Wabash and Salamonie rivers; 370 sq.m.; pop. 70, 1500. It is traversed by the Pittsburg, Cincinnati and St. Louis, and the Richmond and Fort Wayne railroads. Co. seat, Portland.

JAY, JOHN, LL.D. (*ante*), descended from the Huguenots of La Rochelle, France, who fled their country on the revocation of the edict of Nantes. He gained high repute as a lawyer, and powerful political influence, and was the author of the important *Address to the People of Great Britain*, which was one of the early documents issued by the American patriots. He was a leading and influential member of the convention of the state of New York, 1776, and afforded valuable assistance in framing the constitution. He was chief-justice of New York, and a member of the council of safety. In 1778-79 he presided over congress, and was then sent to Spain on a special mission. From 1795 to 1801 he was governor of the state of New York, and it was under his administration that slavery was abolished in the state.

JAY, JOHN, b. New York, 1817; son of William Jay; was educated at Columbia college, graduating in 1836, and commencing practice at the bar in 1839. He was for some years prominently connected with the New York historical society, and other important literary or political organizations, and has published many pamphlets and reports upon public questions. In 1869 he received the appointment of U. S. minister to Austria, and held the position until 1875.



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